

# HOUSES of STONE

*Frederic Tarnham P. L.*

Digitized by



ASSOCIATION  
FOR  
PRESERVATION  
TECHNOLOGY,  
INTERNATIONAL  
[www.apti.org](http://www.apti.org)

BUILDING  
TECHNOLOGY  
HERITAGE  
LIBRARY

<https://archive.org/details/buildingtechnologyheritagelibrary>

From the collection of:

INTERNATIONAL MASONRY INSTITUTE











# HOUSES of STONE

By

*Frederic Foreman Putnam*

G. P. PUTNAM'S SONS  
NEW YORK

ACKNOWLEDGMENT

To Karl La Roche - not just a  
photographer but an artist as  
well.

To Robert Duncan and Eben Wooley  
for their renderings.

And

To Laura Peters with whom I built  
most of these houses

THANKS --

Copyright 1933, 1936 by  
Frazier Forman Peters

## TABLE OF CONTENTS

### PART ONE

#### AN IMAGINATIVE DISCUSSION OF STONE MASONRY HOUSES

- Chapter 1. The significance of Field Stone as a building material.
- Chapter 2. Why are handlaid stone houses not more numerous?
- Chapter 3. Is a Stone Veneer house a masonry house?
- Chapter 4. Concrete ideal structurally but not always ideal artistically.
- Chapter 5. Where does the Flagg house fit economically?
- Chapter 6. Is Flagg Masonry a fake?
- Chapter 7. Where does the Flagg house fit artistically?

### PART TWO

#### ON PLANNING THE HOUSE

- Chapter 8. Money?
- Chapter 9. First experiences with Flagg houses.
- Chapter 10. Ceiling heights.
- Chapter 11. Rules for economical design of Masonry houses.
- Chapter 12. Discussion Plan 117. A house of units designed to grow.
- Chapter 13. Discussion Plan 72. A small house for a bachelor.
- Chapter 14. Discussion Plan 124. A small studio house.
- Chapter 15. Discussion Plan 122. A small six room Cape Cod House.
- Chapter 16. Discussion Plan 57. The Author's house.
- Chapter 17. How does a side hill lot affect costs?
- Chapter 18. Discussion Plan 118. A small house on a side hill for a school teacher.
- Chapter 19. Discussion Plan 129-A. A house on a side hill built around a garden and a pool.



- Chapter 20. Discussion Plan 104. A house on a side hill planned to take advantage of a distant view.
- Chapter 21. Discussion Plan 114 and a few of its variations. Plans 115 and 48.
- Chapter 22. Discussion Plan 128 and its later growth.
- Chapter 23. Discussion Plan 68 - Plan 114 grown up.
- Chapter 24. A simple problem in the arithmetic of design. Plans 300 and 302.
- Chapter 25. Insulation and Ventilation - Air space versus no air space.
- Chapter 26. Plan 203. A logical combination - Concrete and Steel.
- Chapter 27. A family likeness - that's all.
- Chapter 28. Security versus 1929's "What Price Glory."

### PART THREE

#### TECHNICAL DETAILS OF FLAGG MASONRY CONSTRUCTION

- Chapter 29. Evolution of the Stone Wall to the Flagg Stone Wall.
- Chapter 30. Details of Flagg Masonry Construction.
- Chapter 31. Details of finish of exterior and preparation of interior.
- Chapter 32. Some hints on interior finish.
- Chapter 33. What does Flagg Masonry cost?
- Chapter 34. How to estimate the cost of a house.
- Chapter 35. Advice on selection of the land on which to build.
- Chapter 36. Price? Does it classify a house?

## PHOTOGRAPHS

Page No.	
Frontispiece	The headquarters of the Author's family, built from stone picked up within a radius of 200 feet of the house itself. (Plan 57.)
1	White-washed Flagg Masonry. The design smacks of Bermuda.
5	The site called for a Farmhouse type.
9	Actually quite a large house tho the low side walls conceal it well.
11	Stone houses are more easily molded to the site than frame.
15	No matter how small, a stone house could never be called a bungalow.
18	Gables are always interesting.
26	The low ceiling adds rather than detracts from the size of this room.
28	A rough peasant type of Colonial interior.
29	A house should always look as tho it had grown slowly.
37	This simple rectangle seems just a seed around which a real home should be built. (Plan 72)
40	A cupboard no more authentic - no better looking than this could be had from an antique dealer for fifty or sixty dollars - at your local lumber dealer of new wood, tho, it costs about thirty.
42	A stock Colonial fireplace.
44	A corner of the Author's living room showing deep window reveals characteristic of stone houses and that most practicable feature, the tiled window sill.
56	Pine panelled rooms are always attractive but this one especially so.
69	Plans 114 and 115.
71	Still another variation of the theme of Plan 114.

Page No.	
72	Color was the vogue two years ago. Some of us, tho, welcome the relief of an interior like this done in black and white.
75 & 76	Before and After. The designer and builder between them bear the child, but the Owner weans and raises it.
79	Living Room Plan 114.
83	Plan 128 A. It grew and grew.
84	" " " " " "
87	" " " " " "
88	Steel and Concrete. A logical combination. Plan 203.
90	Designed to grow.
95	A studio ceiling gives quite a little dignity to a room. Plan 151.
97	Molded to the ground.
99	Flagg Masonry has a texture and beauty of its own.
123	Fireplace being poured.
130	Plan 72 again.
132	A small stone cottage being built. Upper cut shows outside forms in place - pouring about to start. Lower five days later.
134	Close to the road to give privacy in rear. (See next photo)
136	A relief from the old method of hanging the laundry in the rear and rubbernecking and being rubbernecked on the old type front porch. The back yard of the house illustrated Page 134.
141	An expensive but most gracious type.
147	Studio ceilings are not beyond the average pocket-book when finished in pine and fir.
149	An unusual kitchen.



Page  
No.

- 151 A small cottage.
- 156 Smooth plaster - cove molding - black slate window  
sills combined to breed trim formality.
- 159 Stone and shingle combined logically.
- 162 Shrieking for help with the grounds.



\*\*\* INTRODUCTION \*\*\*

When the war broke out and I enlisted, my mind, like that of all provincial people, was distinctly of the "freshman" age.

Fresh from Engineering School, with my sheepskin as proof of the fact that my opinions were valuable, I was a most valiant and ardent supporter of all that was new.

The chief joy in my life was to have tea or dinner with my father at the Century Club. (Members of the Century Club are supposed to be accepted largely on a basis of accomplishment.) There he would point out famous artists, writers, and editors without arousing the slightest interest in my ultra-modern heart. But, point out a bridge or subway builder, a Klaxon manufacturer, or a hand organ magnate and I was all attention, and basked in the sunlight of their glories.

Father's last words to me as I sailed were "I shall be interested in hearing what your reactions are to the Old World, my son."

We landed at St. Nazaire, from there to Paris, and then to Fontainebleau. I was in a daze. I had not seen a thing particularly startling. Had I been to Moret or to some really old town, it would be easier to understand what was happening inside me, but, even in this short time, I sensed a difference.

In America, the age of man's visible and useful work in building homes is comparable with our own age. But, in Europe, those patient old houses have stood for generations and watched us grow from barbarians to almost human beings.

Their insides have been torn apart and shifted. Their outsides have been painted blue, then white, then neglected and then revived. They have known life, death, birth, marriage, happiness, sadness, war, peace and every other emotion of man, and yet sit there placidly, patiently offering him the same protection they have always offered, asking nothing more from him than a new pane of glass, a few quarts of paint and, occasionally, a tidying of their tiled roofs. How different from our fretting, nervous American frame houses, which droop and pout if they are not continually groomed and manicured.

Compare a French village, where industry has waned, with an American village in the same plight.

NORTH TONAWANDA, NEW JERSEY - Uncut lawns with grass growing high against the house sills, like lapping flames threatening the destruction of rot or even fire itself. Rusting gutters, rotting cornices like the drooping lips of a lost child. Sagging roofs with their tale of rot worse than cancer. Unpainted sides

## II

like the unwashed faces of neglected, unloved street urchins. Patched roofs and neglected, tottering sheds like the battered pails, tin cans and worn out brooms, no longer useful, on the back porches of the homes of slothful and lazy housewives. Crooked sign boards, gaudy advertisements with paste spread wide and heavy, are our parting kick to their self respect.

Now let us turn to MORET, FRANCE - Narrow, bungling streets, crooked and sagging curb stones. Houses crowded to the curb as tightly as children's faces looking for the parade down the street. Roofs this way and that, flat, sloping, straight, sagged - thatch or tile, it makes no difference, - there they are, supported and carried easily as a child in its father's hand by those over-strong masonry walls.

You sense it at once.

Plastered with signs, these houses - Cusnier, Meunier -- but somehow not weighted down with them; rather, like the good old nurse on whom the baby puts its Hallowe'en cap -- tolerating them.

Outside and in, their walls are bare of all ornamentation. Theirs has been a life of utility. Full or empty, they don't seem to care because they have learned man's ways. Were it not for their strength, they would have tired of this game long since.

You have seen pictures of the A.E.F. with her modern trucks parked in front of a doorway where Roman soldiers may have stood. Yet, neither the house nor the truck showed embarrassment (though, of course, some adolescent American in the back row giggles).

The people in these houses are not supporting them as we are but are, in fact, supported by the houses.

When a house has been built that lasts three or four hundred years, and when your fathers or your acquaintances' fathers, as far back as history goes, have lived, year in and year out in it, with no complaint or protest from the house, then you can feel the security that its permanence gives.

The gain is in placidity and in a little more tendency to rest in its security, to chat, to philosophize and to love when one-quarter of man's wants are cared for.

Twenty or thirty dollars a year for maintenance as against one or two hundred has not made for wealth in one year, but in one hundred years \$8,000 to \$16,000 is saved. Over a whole nation this amount of money spent or saved is an appreciable item towards greater happiness and leisure.

After the war, I returned to the states and continued engineering. I travelled a bit through the raw west. I had no anchor.



### III

One day business took me to Connecticut. Here it was again, but this time in frame. Lovely old things. Where they had been kept painted and repaired, they stood like a girl of sixteen going to her first dance, but they had aged, like our pioneer women, barely after their youth when less prosperous times had not furnished them with lip stick and powder.

Here at least, however, was graciousness - and so I bought one. Her roof leaked, her sill was rotted, but I loved her. Slowly I realized she was wilting. My repairs were but narcotics to prolong her agony. Along with her, came land. It must be worked, so I dropped business and put my whole heart and soul into it.

Barns to be constructed, chicken houses to be built, and so I started the same fascinating circle that Ivan in "Growth of the Soil" went through. Soon after I started, I had a fire in one building - two months lost in my program, and repairs and rot bothering me at other points.

Every minute taken from the land was valuable but, at least, if I had been sure each new building was a step ahead once and for all, I would not have begrudged the time so much, but every building meant a continuing obligation of maintenance until all the time I could spare was taken up with painting and repairing. Then I knew this could not go on further.

Plowing around my Connecticut lots, you can imagine what I found -- STONE. Hundreds with faces flat enough to make a mason's mouth water. They didn't rot or burn, were always with me and cluttered up the whole place.

I decided to experiment with them as my building material. I tried to build a cow barn, laying them up myself, but my eye was not so good, so I engaged a mason.

Money seldom comes to the farmer, so I traded labor. Two days of my labor for one of his. It took him two weeks to lay up the front of my cow barn bought with twenty-eight days of my labor besides my time in hauling stone, and so forth, in addition.

The back wall, being in the bank, I poured with concrete. It took only about four days and it was a better wall. That started me into real thinking about the problem, and I experimented with pouring concrete against stones. While trying this, I heard of Ernest Flagg's work on Staten Island and I started exploring.

The method was so obviously intended for people in just my predicament that I adopted it at once and since that time have made Masonry, laid by the Flagg method, the basis of my building operations.

\*\*\* P A R T I. \*\*\*







## C H A P T E R    1.

When I was a boy, I would never speak of a thing as "lovely," thinking "great" or "dandy" less effeminate.

So now, I don't know whether I am tongue-tied by repressions of the same kind or whether, because so many "hokum" artists speak of the "feeling" of materials, I hesitate putting into words why Flagg, and others, including myself, are so desirous of preserving Field Stone Houses and of providing a method of construction that will insure the building of a greater number of them.

So far as the general public is concerned, Field Stone Houses had died out except as museum pieces, so to speak, to house wealthy people of taste.

But the demand for them has persisted, and this demand inspired Mr. Flagg and others to experiment and finally to resurrect an old process, which I, for one, believe fills the bill completely.

To understand the process and its application as described in the appendix, one must understand the significance of the material.

Whether "the chicken or the egg came first," or whether materials, colors and smells gain their "feeling" from themselves or from our own imaginations thru associations, I don't know.

For instance, the "Specialist," in adopting the half moon as the design to be cut into the doors of his familiar product, selected the moon for no particularly logical reason. But now, from frequent use, it has become indelibly identified in my mind with those little outhouses.

In the same way, many materials may have sterling qualities in every other respect, but as a material with which to build a home, are marked off the books.

Cut stone, for instance, has permanence, solidity and security to the same degree as field stone. But cut stone has for generations carried another significance. Its permanence is the uninviting permanence of the pyramids. Its solidity is that of the cold limestone benches in the park, and its security the security implied by the deaf, frigidly self-satisfied walls of a bank.

Cut stone, when used for a country residence, implies the ball and chain imposed on society by those who have fared well and who wish to flaunt their gains and impress their importance on their less fortunate neighbors. Cut stone houses represent those people who have set as their goal, not happiness from warmth and

beauty in themselves and in their surroundings, but rather, thru a feeling of superiority, which has to be marked and labelled, to assure recognition.

Today, almost none of us are able actually to go out into our fields and gather and lay one upon another the stones to build a field stone house. But whether we do or not, a field stone house conveys a feeling of individual effort rather than mass accomplishment, and in that feeling lies its charm.

The fact that the stones are used in their natural state as they come from the very fields on which the house is built, gives a sense of self improvement thru thrift, rather than by acquisition from others. It implies a gracious desire to avoid any expression of the "better than thou" spirit which effectually makes one's neighbors constrained and over-formal. And finally, the material itself combines, with these more delicate feelings, that sense of permanence, solidity and security so necessary for the establishment of a home.

## CHAPTER 2.

In this day and age, any method of building that defies mass production, sooner or later, is bound to failure.

Hand laid field stone houses, therefore, as might have been expected, have gone by the board. Even though, in building them, the number of masons is increased and a large gang of men is employed in an attempt to speed up the work, the process still remains the work of craftsmen, acting individually, as against the team work of a group of men in a modern concrete and steel building operation, where each phase is done by one man or group of men.

Every operation, from the setting of the window and door frames to the placing of each stone in the wall, requires special consideration and offers problems, however minute they may be, that require the judgment and artistry of a master craftsman.

Aside from the high wages paid really skillful masons, which alone makes the cost prohibitive, the inability to introduce straight line production methods into their construction has definitely put hand laid field stone houses in the same class as original paintings, too costly for the average individual.

During the last hundred years, the improvement in mortars, making thinner walls possible and thus reducing labor costs, has offset somewhat the continually rising wage rate, but this has only given temporary relief until labor rate increases again overtake it. Today, many people are looking for relief to labor saving machinery, but I, for one, feel that it also would be only temporary, and that a more drastic change is necessary, and that if field stone houses are to be brought back to their own, a new method, which eliminates the necessity for so many expert workmen, and which is adapted to modern production methods, must be found. The Flagg method combines these qualities, and to them owes its success and its future.





### CHAPTER 3.

In all my time in Europe, I never heard of such a thing as a veneer house, stone or brick. Only a mind trained in building in frame could have conceived of such an idea.

An architect, accustomed to designing frame buildings, in all probability, started it off because he was in the habit of substituting shingles for clapboard for the outside covering material of the building and, in the same way, substituted a stone or brick veneer for the usual clapboards or shingles.

I have no objection to fake scenic effects in the movies, and I don't expect Jeritza to be killed in her classic fall in the opera "Tosca" because the effect desired there is expected to be a reenactment of a past episode.

I have no objection to false movie sets of towering skyscrapers and prosperous business fronts which are no sturdier than the canvas on which they are drawn, but I do object strenuously to the small American city with its false, brick-veneer fronts, giving one the sense of up-to-date-ness, solidity and prosperity which, after all, is only six inches deep and which is followed perhaps by a hundred feet of cheap, frame, rat infested, fire trap construction.

If their proud owners wish to be classed as actors in the great American comedy, well and good, - the setting is right. The audience, too, I think, has at last learned that "Little Bess" was not actually burned at the stake, but that it was all done with mirrors.

- - - - -

The ordinary stone veneer residence is not quite comparable with the false American front, but to my mind, is certainly a long way from good architecture. A stone or brick veneer house is nothing more than a frame house with several hundred tons of stone or brick hung to it. The stone is actually not suspended by the frame house but, at least, the masonry walls are kept from falling over by suitable ties to it.

The most inflammable part of the frame house is the building paper and yellow pine sheathing directly under the outside covering of shingles or clapboards. In the veneer house you have the same material, hence practically the same fire hazard.

By now, you probably have gathered that I am somewhat opposed to veneer houses.



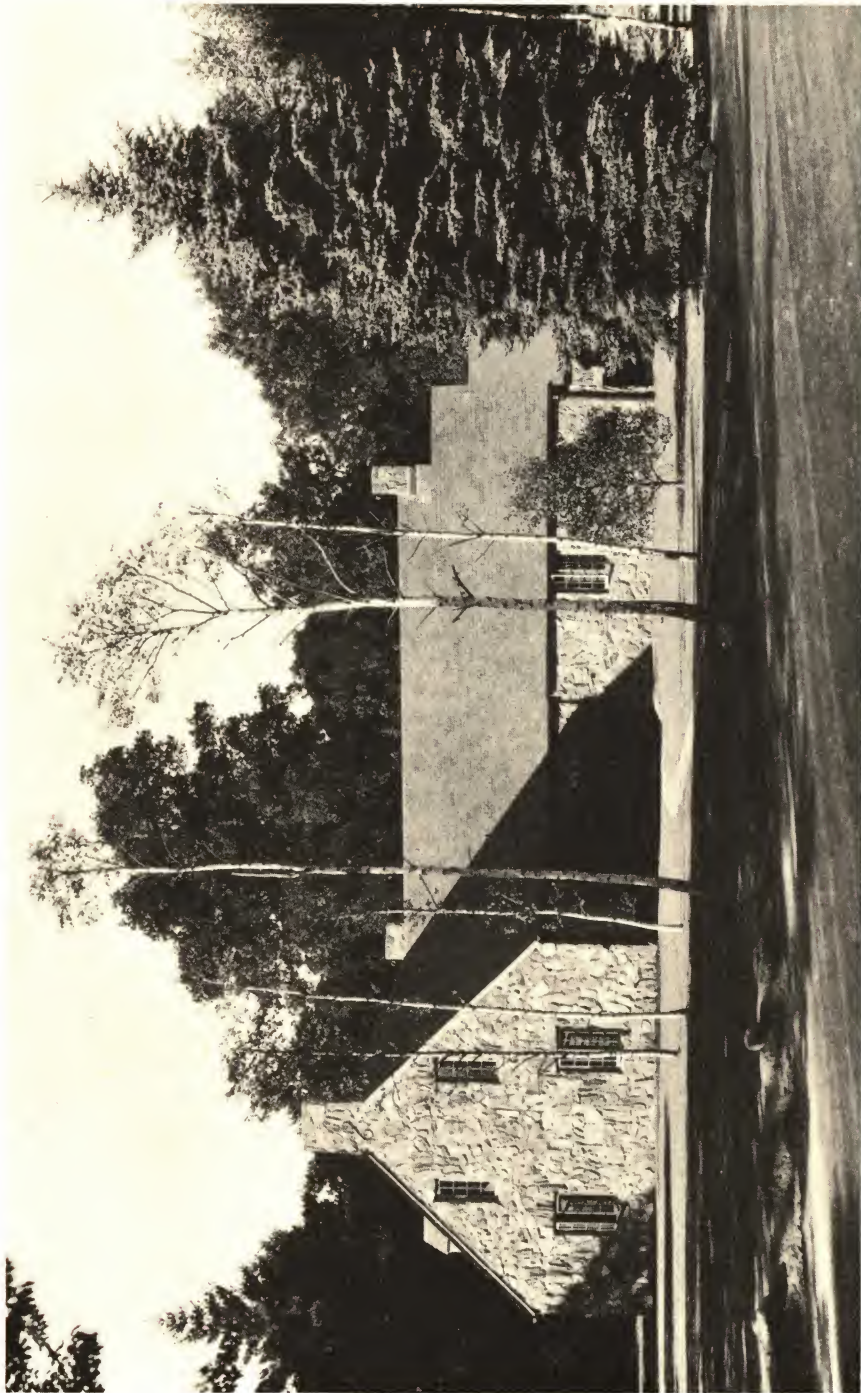
I suppose if someone wants to fool himself, that's his business, but to one who looks forward to the development of a new type of building, more economical than anything we have yet had, any little side excursions into fakes which cannot possibly develop into something lasting, are irritating. They are so far off the track that no serious mind should think of them even for a second.



#### CHAPTER 4.

Epochs in architecture have been caused not by a people desiring something new, but by some economic pressure making a change imperative. At present we are at, or near, a transition point. A new type of architecture, undoubtedly, is being developed. As yet, it has taken no definite form and homes built according to the new art must be considered only as models or experiments. Therefore, at least for the moment, we are dependent upon old types and forms, and we must be content with copying and adapting them to our present needs. This poor excuse is my only defense for even thinking of the Flagg method when I could forget the stone entirely and, using pure concrete, have an equally good, if not a better, wall than the Flagg stone wall.

Concrete is a marvelous substitute for the coral stone of the Bermuda houses, or the adobe of the Spanish villas, both types as worthy of being copied as the Irish or French cottages, but, like everything else, being a little tiring when overdone; besides, particularly in New England, looking cold and out of place. So without blushing, I am passing up the most logical material of which to build a home, and am suggesting a means of imitating the old handlaid stone house frankly by decorating the concrete, an architectural crime which I seldom condone and which I excuse only as a sentimental tribute to memories and to beauty in much the same way as I imagine a confirmed atheist might shed a tear while listening to a Christmas Carol.





## CHAPTER 5.

Having idealized handlaid field stone masonry but eliminated it as impracticable.....having condemned veneer as a fake, and having rejected concrete construction with a condescending pat on the head, I have set a very high barrier for myself in advocating a new process to fill the voids thus made.

The tendency of all of us is to judge the beauty of a town or country by its high-lights and forget the background. Ask someone whether New York is beautiful, and he speaks of the Customs House, the Chrysler Building and the old Post Office. Good or bad, their opinion supposedly is based on a few buildings.

Ask about Long Island, and he will tell you about a lovely Normandy house of Frank J. Forster's, or another by Lewis Welsh or Lindeberg (three truly great architects, to my way of thinking), but fifty, no, five hundred Forster houses could not make Long Island beautiful except at a few particular spots. Why? Because the background is made up of thousands of characterless modern development houses completely lacking in individuality or tradition, and having a sickening flavor of the pretty-pretty running thru the whole thing.

It is the background in which I am interested. I am seeking a new material, not for the few people who can afford a house by a famous architect, but for the mass of people whose budget makes mass production necessary. Give charm and individuality to their homes and you have beauty, no matter whether the high-lights be good or bad.

Drowned, as it were, in the sameness of the houses in these American developments, are millions craving the beauty, charm and distinctiveness of a field stone house.

The necessity for rigid economy had held them back. It is to these people that the Flagg method should be dedicated, because it offers a process ideally suited to mass production whereby their needs may be filled, and though this alone will not suffice to change the whole tone of our American Development, it at least, will have an effect more noticeable than the few attractive homes built for the wealthy or even the semi-wealthy.





## CHAPTER 6.

There is no question but what inventors and discoverers are entitled to tremendous credit for their imagination and foresight, and deserve the rewards society heaps upon them. However, Orville Wright's invention of the aeroplane was merely a combination of wings and gas engine. When the gas engine was perfected, the combination of the two was the most natural step.

So it is with all great discoveries; they are usually just another step in the normal evolution of the industry.

So the Flagg method of constructing Field Stone Masonry houses is merely a combination of modern concrete and handlaid field stone, and in this simplicity lies its great value.

A Flagg Field Stone masonry wall is nothing more than a concrete wall with a field stone facing, the two being constructed simultaneously as one unit.

The construction routine is exactly the same as in ordinary concrete work, except that as the wall is poured, stone is laid against the outer form. In fact, the similarity is so complete that an organization specializing in concrete construction is better adapted and equipped to build Flagg houses with economy than an ordinary mason contractor is.

Of course I expect you immediately to ask me how placing a stone facing on a concrete wall is any different from faking one on a frame wall, as in veneer.

When all the facts are not known the argument seems logical enough, but actually there is no ground for any such comparison.

In the first place, concrete walls have to be given some sort of finish and the stone facing serves this purpose as effectively and almost as economically as a polish or stucco coat. Again, a handlaid wall, to be tight, has or should have an impervious waterproof plaster coat on the inside, the equivalent of which is the concrete backing in the case of the Flagg wall. And, finally, the Flagg wall is a unit of masonry which actually not only supports itself but the building as well, whereas the veneer wall is just a decorative effect placed outside the frame supporting walls.

The gain is not just a pious reaction to honest construction, but a definite improvement in the lasting qualities of the building. Rot or fire in a veneer house will mean the complete destruction of the whole building, whereas in a Flagg or handlaid Field Stone House, it probably will mean nothing more than replacing a few joists or rafters because the walls are free standing, self supporting and able to carry many times the loads normally placed on them.



If it is a fake to build a concrete wall and give it a stone finish coat rather than stucco splashed with pebbles, or burnished with pumice stone.....if it is a fake to build a hand-laid stone wall with an eight inch concrete waterproof backing applied at the same time rather than a two-inch plaster coat requiring another operation.....or if it is a fake to build a stone wall in which the stones are imbedded in concrete rather than in expensive mortar....., then Flagg walls are a fake, at least artistically; but, structurally, never, because they are a structural unit sufficient unto themselves. Take away every other part of the building and they stand. Not so with veneer walls..... take away the inside shell and, although they might not actually fall due to their inertia, still no one in his right mind would even try to support a roof on them.

To this point I have spoken of Flagg masonry as a substitute for handlaid field stone masonry. Substitute implies to me a "just as good," "you'll do," "not so bad," damning with faint praise attitude.

It would be unfair to leave such a flavor behind because Flagg masonry has both structural and artistic characteristics of its own as well as being able to substitute for handlaid masonry.

In its logical application, the most should be made of the stone facing as a decoration and the concrete backing as a structural element. In other words the stones, if there is any choice, should be placed so as to bring out the greatest amount of color and the concrete made as large a proportion of the wall as possible.

I am not questioning the carrying ability of stone when I speak of the structural qualities, but I am considering its waterproofness. Stones are porous and tend to lead water into the wall. Therefore it is more logical to lay them edgewise than flatwise, so that they penetrate the wall to a lesser extent and so that the joints tend to drain. So Flagg houses have come to be known by the large flat surfaces of the stones being exposed, rather than the thin skimpy ends being shown.

The result was unexpected and quite startling, because instead of the dull grey effect so familiar in most masonry construction, the Flagg house became a riot of color. It is the face, and not the end of a stone that rusts and corrodes to give those soft tans, blues, reds, browns and contrasting blacks inimitable and yet so naturally a part of the landscape.

Some architects object to this method of laying, and to them I commend the Flagg method with the stones laid to copy the old form of masonry, because it gives them a better, cheaper and stronger job than the old way, but for myself I prefer the bright, cheerful, no less earthy or real effect produced by using the stone to its utmost for its natural beauty of form and color.



## C H A P T E R    7.

Most people understand well enough that certain things do not go together, for instance, a blue and white striped tie does not go well with a dress suit. Very few, though, know what things do and do not go together architecturally.

Modern art has as its basic idea steel and iron stamped to one pattern and all through the designs, there is a monotonous undertone of angles and curves, painfully correct, continuously repeated, amidst long, straight lines which only a rolling mill could duplicate.

This is a stage in the natural evolution of a new element in building, finding its own place as it wipes out the competitor, frame, and with the field to itself, getting down to real business.

No longer do our skyscraper designers try to copy wood or masonry trim and cornices with steel and iron. No longer do we put a wood grain on steel doors. Steel and iron have proved their worth, so the designers no longer try to hide the material, but actually accent and acclaim its use, and by so doing, give the building or room the trueness and severity of which they are symbolical.

We have lived through this cycle in steel and iron and can reconstruct by studying the old buildings around us, the same kind of cycle gone through by frame.

The really old frame houses were built of hand hewn timbers. Outside and in the houses reflect this irregularity of the hewn timber. Not slovenly inaccurate, they had the inaccuracy resulting from careful work with tools not developed for precision.

Flooring and panelling were of no particular width and without square edges. Trim was narrow when used and often practically omitted.

There followed, as tools were developed, the phase steel has just gone through. The show-off period. Buzz saws, scroll saws, planers, grouters - all of them represented in any pre-war home. The living room became an exhibition room of the strange and weird things that could be done with any or all of them. Then frame finally settled down to the final desperate battle it is now waging with steel and concrete. The scroll and more delicate saws have been set aside and used very little, and the only tools retained are the straight line tools like the planer and the buzz saw. These tools symbolize the good frame architecture of the last few years. Short straight lines, panelling, narrow but uniform, floors true and uniformly narrow. Wood is still used recklessly, but only if the labor involved is limited and the cuts single and straight.





Handlaid masonry represents the same phase in the development of the masonry house that hand hewn timbers mark in frame. Cut stone is the parallel of the modern frame house, and to it belong the ugly short straight lines of the buzz saw.

Many people building in frame today, try to produce the effect of the old hand hewn timbers by purposely introducing irregularities. Unfortunately, however, this costs more than building with standard material and usually looks forced, unless hand hewn lumber actually is used. But in masonry, at no more cost, we are able, even when the Flagg method is used, to get the same lovely effects obtained, using field stone as the building material, in the old homes of the craftsmen.

To the field stone house belongs the irregular, immense flag-stone dragged from the back lot to form the front door step. To it, belong masonry arches carefully inspected for trueness but having just enough imperfections to give them a certain human warmth. It makes no attempt at any point at a gaudy display of carpenter's artistry. The trim along the cornice is a narrow board to cover the irregular top edge of the masonry. Because, after all, a masonry house is being built, woodwork is out of place and the window and door frames even are deeply embedded in the masonry, so that little around them is exposed.

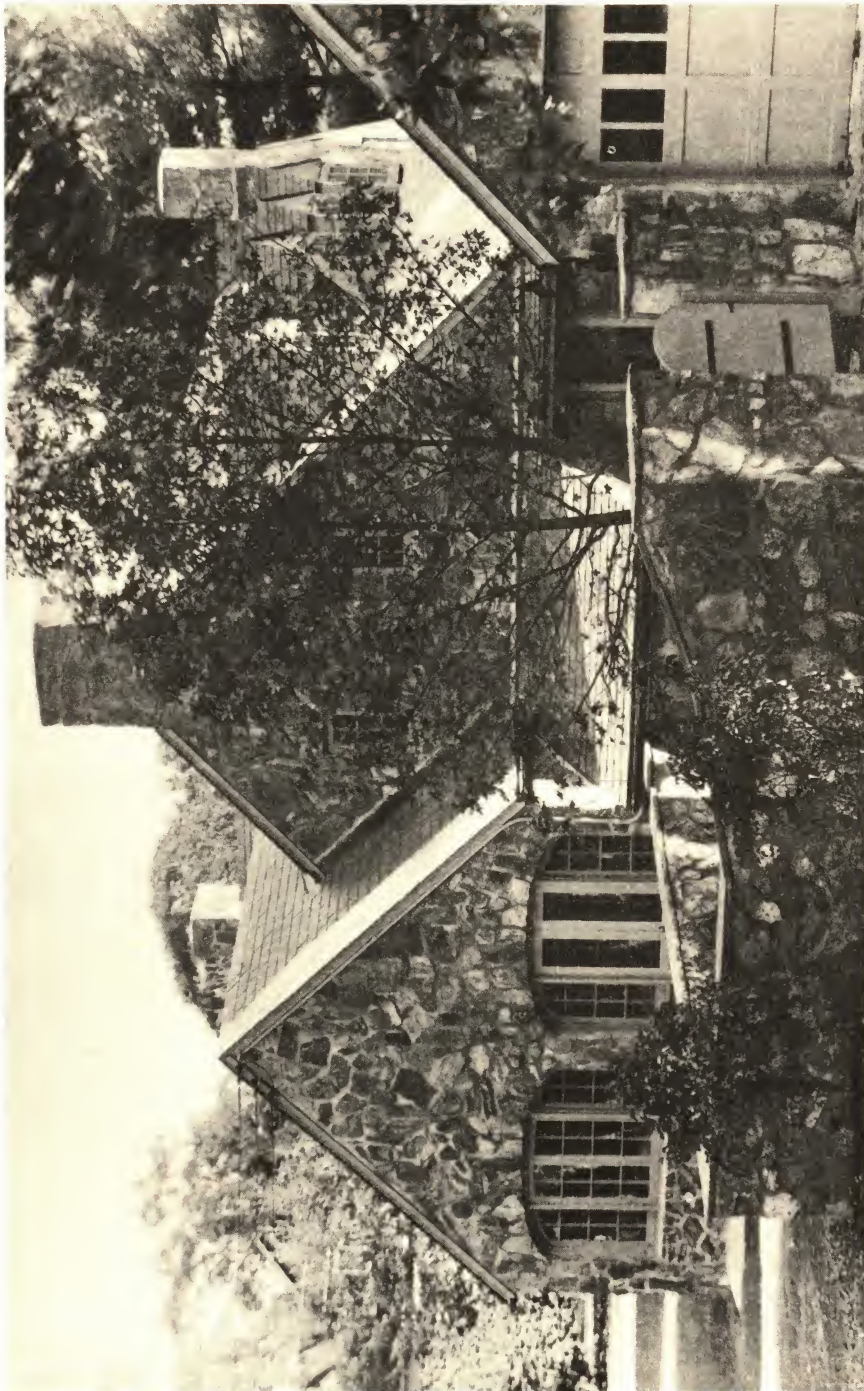
The interior, in the same way, has almost no wood trim. The window and door frames are set deep in the masonry to form a lovely reveal and the sides of these reveals are plastered following the natural lines of the masonry and taking from their depth a note of color by shadow and contrast which no human could repeat by any set formula.

The base likewise is a simple narrow strip set in the plaster, not for decoration, but purely as protection to the plaster from the strenuous sweeper.

Throughout the whole interior, this simplicity should and can be followed to get the maximum effect from the material, and in so doing not only will an economy be effected, but, being so evidently not of the steel and iron period in which we work all day, a sense of rest and quiet will be generated by the very remoteness of the machine.



\*\*\* P A R T    II.    \*\*\*





## CHAPTER 8.

It is very hard to advise one on designing his home without preaching and without sounding over-egotistical.

One hires an architect not to be overpowered by his ideas, but to have him interpret one's own and put them into materials. For him to do this, however, there must be a common meeting ground on the fundamental ideal to be sought.

If, therefore, this section of the book sounds a bit heavy with my ideas, remember I assume that, temporarily, I am acting as your architect and without mincing words am setting forth my ideals, so that you can decide for yourself whether or not you wish to continue the relationship and study my plans.

The greatest obstacle you and I will have to face in planning your house is money. You probably think that that is unique with you, whereas, as a matter of fact, it is present with all clients. To be sure, some have more money than others, but invariably they also want more house, so that, in the final analysis, what we do in every case is controlled by cost.

Many times, after some particularly difficult problem, I have prayed that some day the Good Lord would send me a client who set no price limit and who let me do as I wished. I have thought that for him I would produce a masterpiece, but then again I have realized when a job was done that the ingenuity and thought required from both the client and myself in overcoming this obstacle of price, resulted in giving the building a personality and charm not obtainable by any less painful method.

This may sound like hokum, but, nevertheless, it is true. If you do not believe it, look around you at the homes of millionaires, where money has been lavished on architects, decorators, and landscape gardeners.

We won't be able to give people the jitters by putting a million beautiful things into our buildings, as the architects in the Harkness Memorial have. We won't be able to overhang our roofs six feet, nor do many other things which money seems able to do. We will have to tend strictly to business and be satisfied to get four walls and a roof, with perhaps a special entrance, a few arched doors and an attractive terrace thrown in.

The business man often frets under this restriction and as a result is likely to have a certain inferior feeling about the building. The artist, though, I have found, is not bothered by this; in fact, just the reverse is true. He is stimulated by it, and, between us, we invariably evolve something which not only is practicable, but is dignified and attractive as well.

I wish I could convey this feeling to all my clients.



It isn't just a case of sour grapes, a building to be attractive must be simple. Plentiful supplies of money tempt one to decorate. For one of small means, the jam pot is out of reach, making him digestively better, if not morally, and although lack of money in itself will not guarantee beauty in a building, at least it assures one of a certain degree of simplicity.

Comparable with the ornateness of a millionaire's residence, is the tendency toward too much Greenwich Village atmosphere, particularly noticeable among newcomers in the pseudo artistic circles. Avoid dripping plaster, colored bath fixtures, etc., for they are as tiring as a loud checked suit. Work out this extra enthusiasm of youth in something more easily corrected, as for instance, extra gay paint or paper, and keep the fundamentals plain and simple, so that they will fit all your whims and fancies as you mature.

Finally, having agreed on these points, I ask, pray and beseech you to leave the matter of proportions both interior and exterior to the architect. Ceiling heights, window sills and locations must be determined not by an arbitrary selection on your part, but by the size of the building, its location and many other factors, of which he can judge better than you.

## C H A P T E R 9.

Immediately following any invention or discovery, the public, spurred on by its enthusiastic disciples, is led to every conceivable kind of excess in its application. Aeroplanes are used for weddings, or even mothers to give birth to their offspring. The Radio Broadcasting systems are used as a means of sending confidential messages of love even to persons available through the more antiquated and conventional methods, and people, separated by thousands of miles, have been married by the same means. The result of this early misdirected enthusiasm is always harmful and those participating in it are apt to believe the older, even the conservative methods, were nicer and more practicable.

A railroad locomotive may be an economical means of hauling a 300,000 ton load at one crack, but is not one to be selected to deliver a postal card. A 1,000 foot skyscraper may be an economical means of providing space where land costs \$20,000 a square foot, but it is not, where land sells for \$100 an acre.

When first introduced, Flagg houses were hailed as a cure-all for all the ills of the person of small means wishing a home. I was one of those carried along by the first wave and, in fact, found myself thrown up on the rocks by it without even a derby hat.

The Flagg house, as conceived by Mr. Flagg, included not only the new method of laying masonry, but also several other innovations and economies intended to offset the extra cost of masonry over frame. Unfortunately, these innovations, for one reason or another, have not been effective, so that persons building Flagg houses have not realized the expected economies.

For my own part, I have discarded all the Flagg features except the method of laying stone, so that homes which have been built by me should not be known as Flagg houses because they are only Flagg Masonry houses.

Unit for unit of side wall, Flagg Masonry costs more than frame. The difference in cost between the two being dependent upon the height of the wall in question. In low, straight walls, the costs are comparable, but as the height increases, the ratio of cost of masonry against the cost of frame construction increases, so that stone masonry becomes a definite luxury.

But to me, the problem is not simply one of comparative costs. Even should stone cost four times as much as frame, if I could afford it, I should prefer it.

Structurally and artistically there is, in my mind, no comparison. I have seen both types of houses struck by lightning and threatened by fire. I have paid the coal bills for both, repaired and repainted both, and I have been convinced of the supe-

rior qualities of the stone house and of Flagg masonry over any other type of stone masonry.

However, until the matter of costs is settled, there is little to be gained by discussing superiority. Every year, I carefully figure how much I would save by buying a fur coat to last for ten years instead of a wool coat every two years. A high priced car probably would be more economical than the cheaper ones I have to buy. But, despite all this figuring, I still have a cloth coat and a cheap car because I cannot make the initial larger outlay of cash necessary for true economy.

And that is the situation of most people desiring stone houses. Realizing that they have better resale value than frame, are cheaper to maintain, and that, even if they cost more, they would be an economy in the end, people still have only so much cash to spend now and with that must get adequate homes. If stone isn't within their budget, they must have frame, and if frame is beyond them, they will continue to rent or build of cardboard.

It was this problem I faced when I found the expected economies of the Flagg house, at least for me, a myth.

I was determined to build of stone and to build moderately priced houses. I continued to design and build, and studied my costs carefully.

At first, they seemed to have no relation to each other. Some designs were extremely economical and others excessively high. The economical ones I developed further, and the costly ones I dropped, until finally I realized, in my blundering way, I had developed some definite principles of design which were not new but were merely the same rules followed by the old craftsmen building in stone hundreds of years ago.

By following these logical rules of design, the houses became not cheaper than frame perhaps, but well within the pocket-book of people of moderate means, which was what I was striving for.



## CHAPTER 10.

My discoveries are not startling, nor anything that anyone does not already know, but still I see very few of the stone houses which are being built around me, following them.

In the briefest way, these principles are:

- 1st: Keep the side walls low.
- 2nd: Keep the perimeter as small as possible.
- 3rd: Eliminate corners and make shape as regular as possible.
- 4th: Utilize enclosed space to the fullest extent.

They can be summarized even more briefly by saying, make the side walls for a given volume of utilizable space as small as possible.

I have had these same statements repeated over and over to me by architects, students and draftsmen, and yet somehow I didn't and don't believe they will get their true significance until they actually know, as I do, what an increase of one foot in the height of a wall means in either dollars and cents or "human sweat."

An extra foot in the height of the masonry walls of a house may mean just a stroke of the pen in the drafting room, but on the job, it means handling one ton of stone and concrete for every twenty feet of wall. If this happens to be added to a wall already ten feet high, a pleasant day's work has been taken on, either in paying to have someone else do it or, if you have gone rustic, in doing it yourself.

The old farmers with their stone houses knew what this meant and sometimes, as I have looked at one of their old buildings, I wondered what happened to make them shift from stone to frame for the last four feet on one gable. Perched away up there twenty feet off the ground, he probably handled the material by pailfuls. Tedious, slow work. Was it sickness or winter coming on that made him shift to frame so suddenly? But shift he did, and so, in designing, many times I have had to shift as costs mounted beyond the budget allowance, despite the fact that the walls were kept low to start with.

Of course the modern mind asks why we don't use labor saving machinery?

As far as the small house is concerned, labor saving machinery has not been a success, so that except for the use of the wheel-barrow and the concrete mixer, the methods employed are just about as primitive as those used by the old craftsmen hundreds of years ago.

Costly elevating machinery may be suitable to an office building or factory project but is out of place on the small house where the total cost of the masonry is only one or two thousand dollars.

Keeping the walls low, though, is not enough in itself, because even though low masonry walls cost only a fraction of what high ones do, still, even so, the low walls cost more than frame. Therefore, in order to be on a par with frame, the house must be proportioned so that each unit of wall area encloses the greatest possible amount of utilizable space. In other words, the building should have the smallest perimeter possible.

Theoretically the best outline would be a circle - next a many sided polygon, both of which, however, bring their own expensive problems in roofing and arrangement, so that we are left no choice but the square.

It is difficult to get good room arrangements in square buildings so, except for the Salt Box, they are not general, but you will find the old stone buildings tended to be very full in width, approaching the square, with this idea of economy of masonry as the reason.

The elimination of corners and irregularities of form is necessary, not only to keep the perimeter small, but because corners consume extra time, so increase labor costs. This is particularly true of the Flagg system of masonry, where straight runs are cheap, but corners and small irregularities relatively much more costly, due to the extra form work.

Having built his stone house at considerable cost or effort, the old farmer was loathe to add to it until he had completely exhausted its possibilities. We, today, are in exactly the same boat. Our competitors may be careless of space, but we almost have to develop an extra sense in its use. So we, like the farmer, must utilize every part of the space enclosed within the side walls and roof of our building.

This naturally leads us to the space directly under the roof. Most people have the idea that rooms under the eaves or attic rooms, as they call them, are necessarily hot and generally useless.

Every time my storage battery goes on the blink and I have to use a crank to start my car, I wonder how we ever got the darned things going in the days before self-starters. Then I remember that the old hand cranks were really quite elaborate affairs which, compared with the inadequate ones of today, make cranking almost a pleasure. The design of hand cranks, in other words, has become a lost art, as has also the proper design of attic rooms.

A so-called attic room not only can be a cool room, but

can be developed to give a room of much more character than ordinary square ceilinged rooms. Drawer sets, cupboards, bookcases, and countless interesting things, which not only make for convenience, but charm and interest as well, can be worked in under the eaves.

In the plans you will see that provision has been made for furniture and that, except in rare cases, cross ventilation always is provided.

As cross ventilation alone is not enough, I invariably arrange to have at least one window in each room right at the ceiling, which causes what I call a "stove pipe" action of circulation, actually drawing the hot air from the room.

Flagg uses ridge dormers to accomplish this. I do not like them aesthetically, so abandoned them, and just arrange my ordinary dormers to accomplish the same result less ostentatiously. These precautions in themselves are enough to keep the rooms as comfortable as any second floor bedroom, but add to them the modern methods of roof insulation and there is double security on this score.





## C H A P T E R 11.

Before passing on to actual plans, I would like to speak of ceiling heights in general.

Until fairly recently, most of the building codes of large cities required very high ceilings. So far as I can make out, except in the case of assembly halls, etc., the regulation had as little relation to real health as the terrible old blue glass transoms required in schools and orphanages to protect the children's eyes and ward off disease.

But, like many other myths, the old code has been accepted as fact and the erroneous idea arisen that high ceilings make rooms cooler in summer and healthier in winter, and that anything else looks cheap.

The idea that the air in a high ceilinged room is any fresher or cooler than in a low ceilinged room is ridiculous. In a high ceilinged room, there will almost always be two or three feet of dead air pocketed above the tops of the doors and windows. This air is hot and it stays there as a blanket of rancid, stale air on the top of your head. In a room having 7'6" ceilings, there is no pocket and all the air is continually circulating through the doors and windows; and naturally the room is cooler and fresher.

High ceilings, of course, mean more masonry, and so higher costs and high ceilings, in the small house, also mean bad proportions.

Add a foot to each floor of the Empire State Building and it becomes even grander than it is now, but add one or two feet to each story of the isolated small house and it is likely to look more like a switching tower than a rambling old farm building.









## C H A P T E R 12.

PLAN 117: (Photo Page 29)

Plan 117 was developed from the original unit 117A.

All the old craftsmen's houses were built in this way, starting always with a unit just big enough to take care of his present requirements with some, but not too much, provision for the future.

As the property developed (not in the modern sense) and he became prosperous, wings were thrown out here and there to supply additional space and to care for a growing family.

Starting from this original plan 117A, I have developed it from the single unit to the larger one shown in the lower right hand corner, or by adding at an angle, as in 117.

This was done, however, not with one family, but with six families liking the first unit, but having larger requirements.

With pocketbooks what they are today, everyone has to build for today's requirements, forgetting what may come. But I hope this plan may show them a way to build for today and yet provide what tomorrow may require as well.

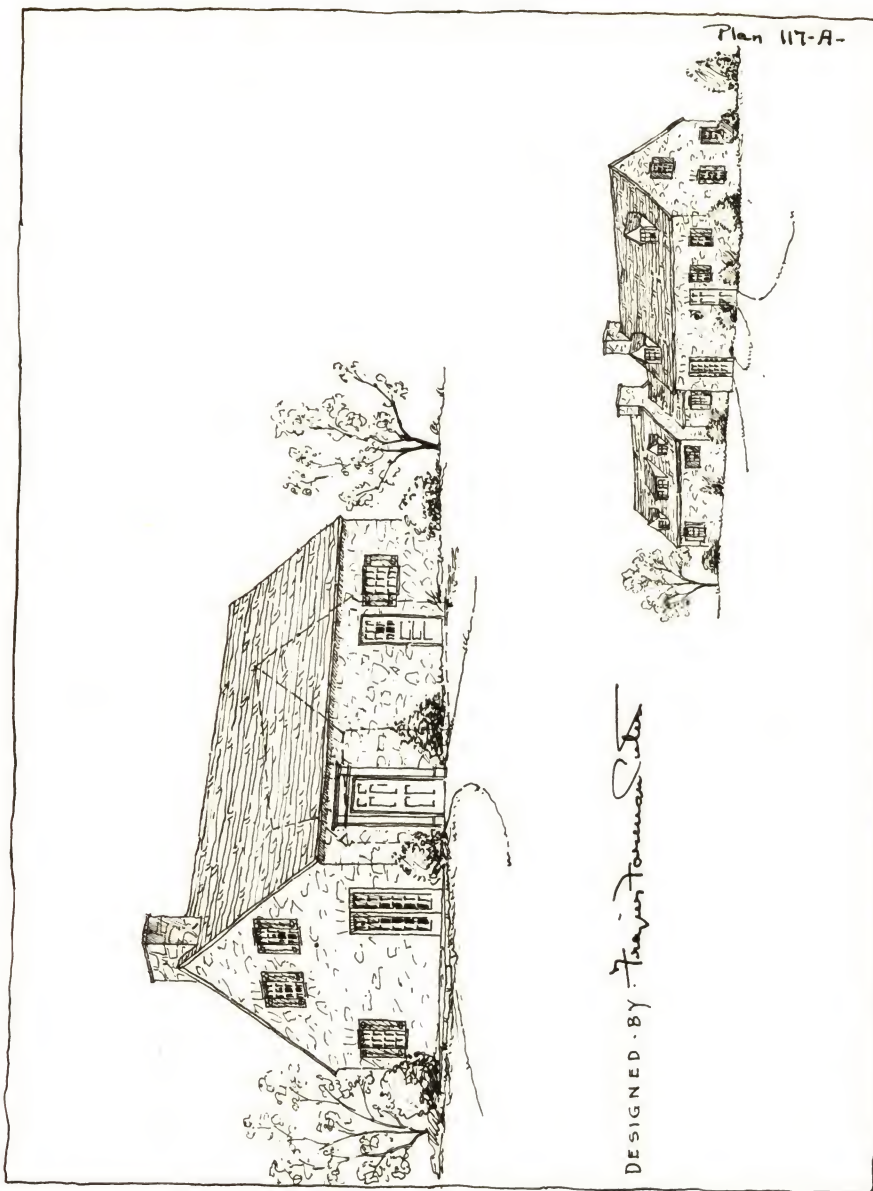
The unit 117A as planned is distinctly just a man and wife affair. It is a small house and yet not a miniature. By a miniature, I mean one of those small houses occupying the same space as this house, but having many more rooms. A house of that kind can never be enlarged, because all its units are in miniature. On the contrary, the three permanent rooms in 117A, namely, living room, bedroom and bath, are all generous and would fit a much larger house.

The kitchen is the only room I plan to move around. However, that is not very serious, because both cabinets and sink are easily moved, and I feel that the focus should be on the living room rather than on some other room.

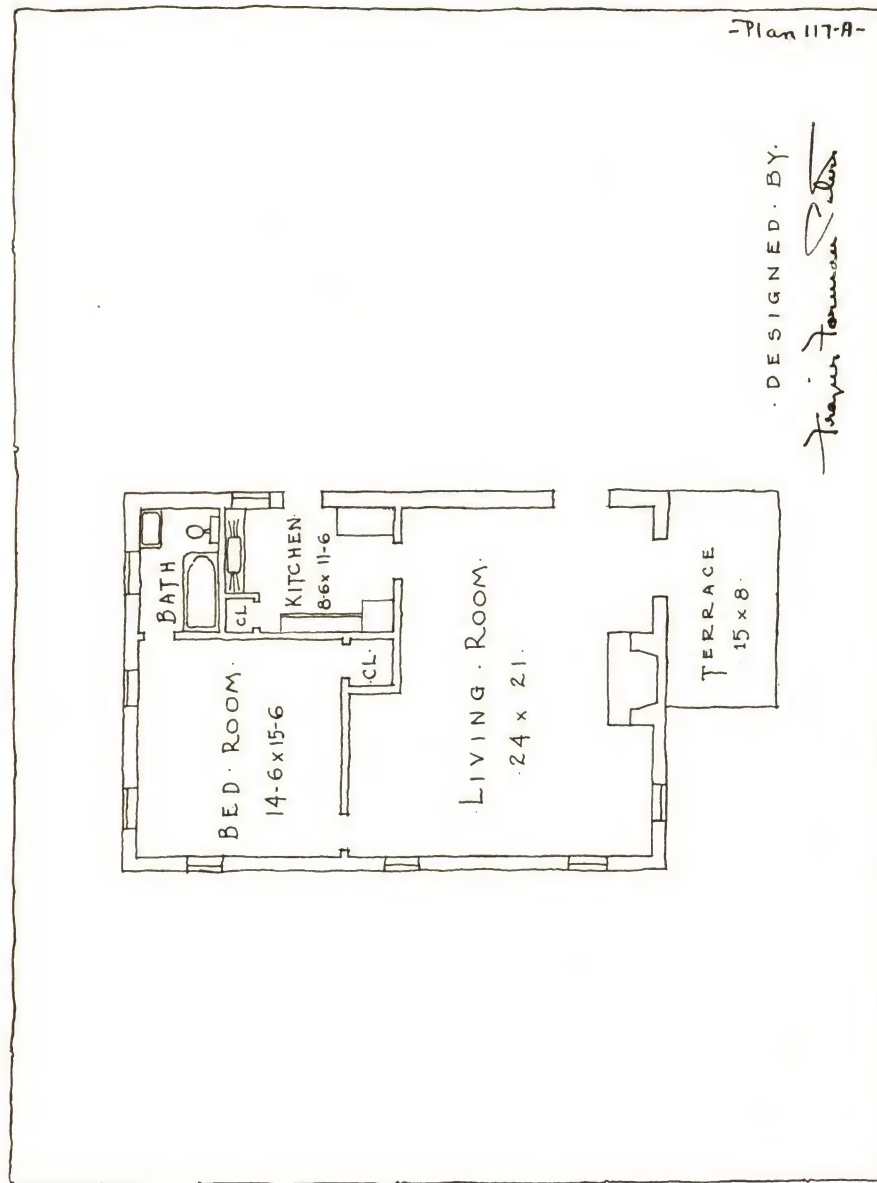
I also have a fellow feeling for the heads of the family, and have carefully avoided disturbing them, feeling that the preservation of their sense of privacy and permanence in their quarters, as the building grows around them, is a most important consideration.

Probably the first rooms to be added are accommodations for the heir and his nurse.

Personally, I do not like mixing servants' and children's quarters. But until the child is three or four, it is a convenience to have the nurse's room next to the child's, and where funds







are limited, it becomes, I am afraid, a necessary evil. So my first addition would be the development of two rooms and a bath on the second floor, and the addition of a kitchen and the conversion of the former kitchen into an entry hall and stairway.

The conditions on the site will dictate the direction in which the addition should be made. I have provided openings on both the side and end, but from this point I will not attempt to direct the owner in its location, because he has lived in the house and, by now, knows how it should be placed for view, sunlight, noise and any other factors important to him.

In Plan 117 I have made communication between the maids' quarters and children's rooms circuitous. If this is a disadvantage, a hallway can be provided between the end room and the maids' wing, and I recognize it is a desirable thing in many cases, but most people, by the time they have reached that stage, I have found, do not desire it, because their children are too old.

Returning to the first plan, you will note that the height of the side walls and the width of the building were made large enough at the start to give generous rooms above. This is important, and should not be overlooked.

The building is not square, being 26 x 38. Had I made it any wider, I would not have been able to use the space as efficiently and thus would have made no saving.

The details of heating plant, etc., I will not go into here, except to say that a plant adequate to the finished building should be installed at the start, as the extra-large boiler necessary would probably not add more than one hundred dollars (\$100.) to the first cost, whereas changing boilers, as each addition is made, would add several hundred.

\*

I am always amused by people making wise cracks at stock plans and the sectional idea. I wonder if those people have ever been through New England.

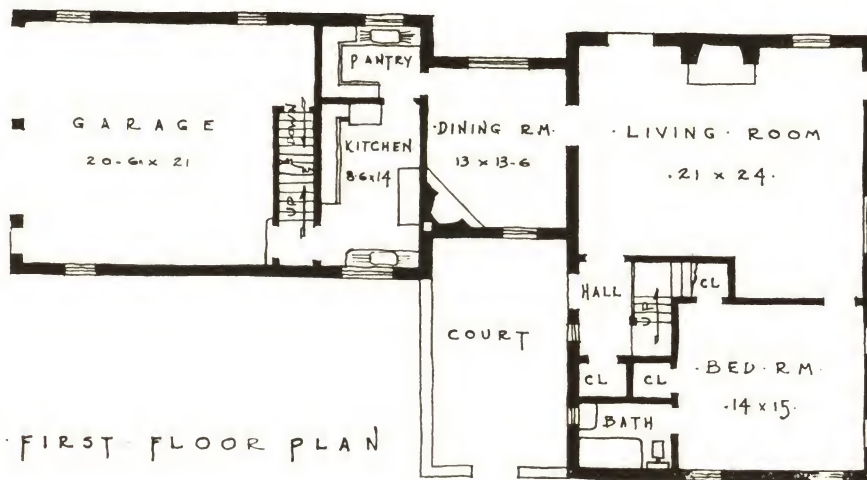
I couldn't imagine a better way to teach colonial architecture than to take a set of unit blocks modeled from the twenty, or less, common units of which most of our old Colonials are varying compositions.

Give him pasters of Colonial windows and doorways to stick on the blocks, and let him make every possible combination, and he will have the spirit of colonial architecture.

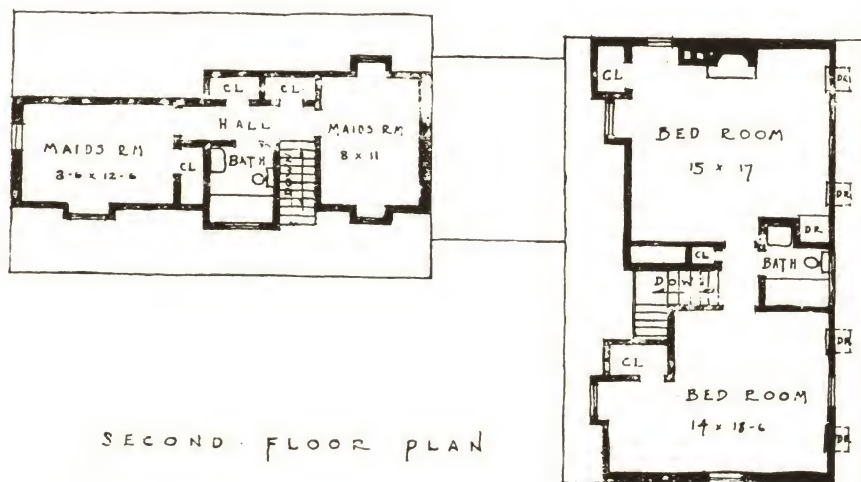
The very framework of these buildings was ideally suited to fabrication in large quantities. They are framed exactly as our skyscrapers are, there being no connection between the frame and the outside covering or openings, as in our modern frame building.



- Plan 117 -



FIRST FLOOR PLAN



SECOND FLOOR PLAN

These old craftsmen had sense. So long as plans that had proved so satisfactory were available all around them, they didn't launch into some kind of an orange stuccoed freak. No, they frankly copied, and as time went on, copied again, in making their additions, and they were so successful that the wealthiest and greatest architects are still copying their simple plans.

In Europe, the same process went on. Hendrick Van Loon sent me postals from Holland showing streets full of houses exactly like the one we built to his order here in Westport, and in Old Hurley, the descendents of the same people built again the same type house.

I, for one, believe a halt should be called to this mad game we designers play and must continue to play if we are to live, and say here is a plan that, though it may not be a masterpiece, at least does not offend and is so simple in design and lends itself to such countless variations that it offers at least one set of units for a definite type of modern stone house, which has proven to be both economical and practicable.



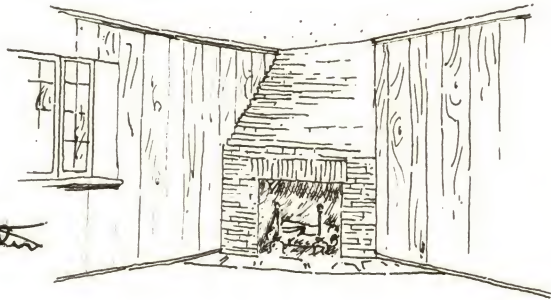
Plan 117



PERSPECTIVE VIEW.

DESIGNED BY

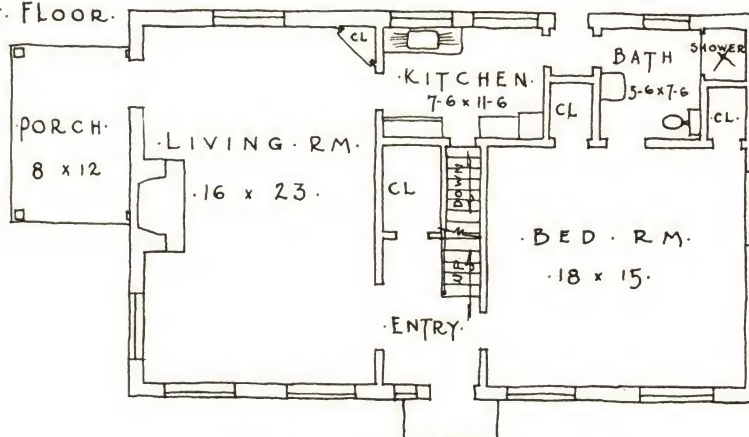
*Major Forman*



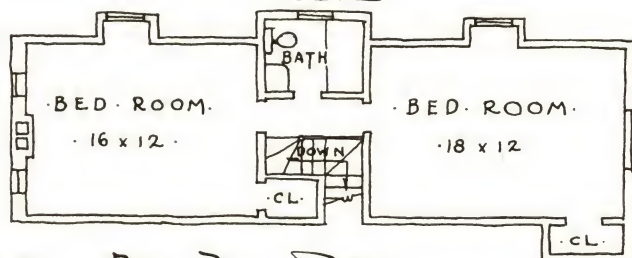


• PERSPECTIVE • VIEW.

1st Floor.



2ND FLOOR.



DESIGNED BY. *Frazer Forman Peters.*



### C H A P T E R 13.

PLAN 72: (Photo - Pages 37 and 40 - 42 and 130)

To the casual observer, this plan is very similar to 117A, just described, but as a matter of fact, it has a very different personality.

This house is much more mature than 117A, and is designed primarily for a grown family, and the additions can be conveniently made for greater comforts for them; still, it does not adapt itself as well as 117A for a larger family than it was designed for.

This house was built for a very opinionated bachelor. He had been looking for a house for some ten or fifteen years, so knew exactly what he wanted and was able to convey that feeling to me.

He was introduced to me by a mutual friend and started at once, without listening to a word I had to say, damning each and every modern builder in the country, myself included.

Between spasms, I gathered that he was a lover of the simple old Colonials which were frankly nothing but well proportioned rectangles with a roof.

He knew every old house for twenty or thirty miles around Westport, Conn. He had obtained estimates on reconditioning or rebuilding many of them. In each case, though, he had always found that the cost and bother were excessive, so he had kept on looking, hoping sometime to find one put back on the market at a reasonable price, with all this work done.

After fifteen years of waiting, however, he found the unremodelled ones about gone and the improved ones, put up for resale, priced away above their real value. He hadn't yet given up, but had resigned himself somewhat to the idea of living from year to year as he was, with faith that some day he would find what he wanted.

To some, this passionate search for just the right house may seem a little far fetched. But if one follows the tenets of Havelock Ellis and believes that the true artist is not one who draws or paints, but rather that person whose whole life and thought is adjusted to beauty in every thought, action, or thing, then one understands why any really sensitive person wishes to start with the proper background, his home, and until he has established that point, is in a continuous state of flux.

My client's ire, of course, was directed at the thousands of so-called development houses with their futile attempts at individuality.





Often people speak of the sameness of this type of house in comparing them with the older types built by the old craftsmen, which they claim have individuality. Line for line, the reverse is the case. The old Colonials are as alike as men's evening clothes, and the modern housing projects give as much variety as checked, striped or pepper and salt street clothes.

But the simple house, like your evening clothes, forms a better background for your expression, whereas the pepper and salt suit type remains the expression of the cloak and suit designer, with possibly some credit to you for selection.

Having gotten this out of his system, my client explained that he wanted to be independent of servants. If he could afford to have a maid or man servant, he would add a wing, but, for the present, things must be arranged so that he could handle it alone.

He wanted at least two guest rooms, but, since he was to be cook, the guests were to be on the second floor and his room located next to the kitchen, so that he could slip into it directly without trapezing through the living room. In other words, as long as he was going to be the servant in the house, he wanted the kitchen handy to his room.

This connection was made from his bath to the kitchen entry. Not ideal, possibly, but there were so many doors in the kitchen and his room already, that another would have made it impossible to place the necessary furniture.

The next most important requirement was the living room. The average house of this size would probably have a 10' x 16' dining room and a 12' x 16' living room. It would then be what I call a house in miniature. Both rooms adequate for one or two people, to be sure, but entirely too close for placing furniture or entertaining guests without everyone feeling like a chicken put to roost.

Therefore, though a combination living and dining room is admittedly a makeshift, we both agreed a large room to serve the dual purpose preferable to two smaller rooms, and since our budget would not permit of two large rooms, the dining room was eliminated.

My client and I worked out the floor plan shown, and he resurrected a clipping from a New York Newspaper to indicate the ideal for the exterior.

The clipping happened to be one of my own houses built on Chestnut Hill, Wilton, Conn., so that point was easily settled.

The window arrangement was reached entirely by consideration of light and draft. He wished a spot next to the fireplace to set an easy chair and have light over both shoulders. He wished





to have a blank wall at the foot of his bed and to have one wall of the kitchen practically solid glass.

When the whole plan was done, there was some talk of scouring the countryside for especially lovely old mantels, corner cupboards and bookcases. But finally, after seeing the really good looking simple cabinets and mantels in proper sizes, properly built, manufactured by various trim houses, he was more than willing to incorporate these modern fixtures as well in his home originally thought of as an antique.

This plan, while not suited to most of us, has proven ideal for him and would be equally satisfactory for a couple not planning for an increasing family.





## C H A P T E R 14.

### PLAN 124:

This house was planned for an artist and his wife, and finds its counterpart in the small studio apartments in our larger cities.

Here again, as in Plan 72, the living room is very large and in this case is carried right to the peak of the roof to give a studio effect.

Ordinarily, vaulted ceilings are regarded as quite an extravagance, and where tricky false timbers are used with plaster effects between, they are. But in this house, 6 x 6 fir rafters on two foot centers were used to hold the roof and exposed below for decoration. The rafters were covered on the outside by sound but knotty (#2) White Pine to give a boarded ceiling effect to the room below. The pine was covered with Cabot's Quilt for insulation and shingled on furring strips. This is more or less standard practice with me, and permits giving the studio effect at a very nominal cost.

I very often am asked to "hack" my timbers in imitation of the old hand adzed ones, but out of one hundred houses I have built, I have only consented once.

The old woodsmen adzing timbers from the rough tree would blush to see the scaley imitations made artificially today. The artificially adzed timber resembles nothing so much as a fish with his scales rubbed the wrong way.

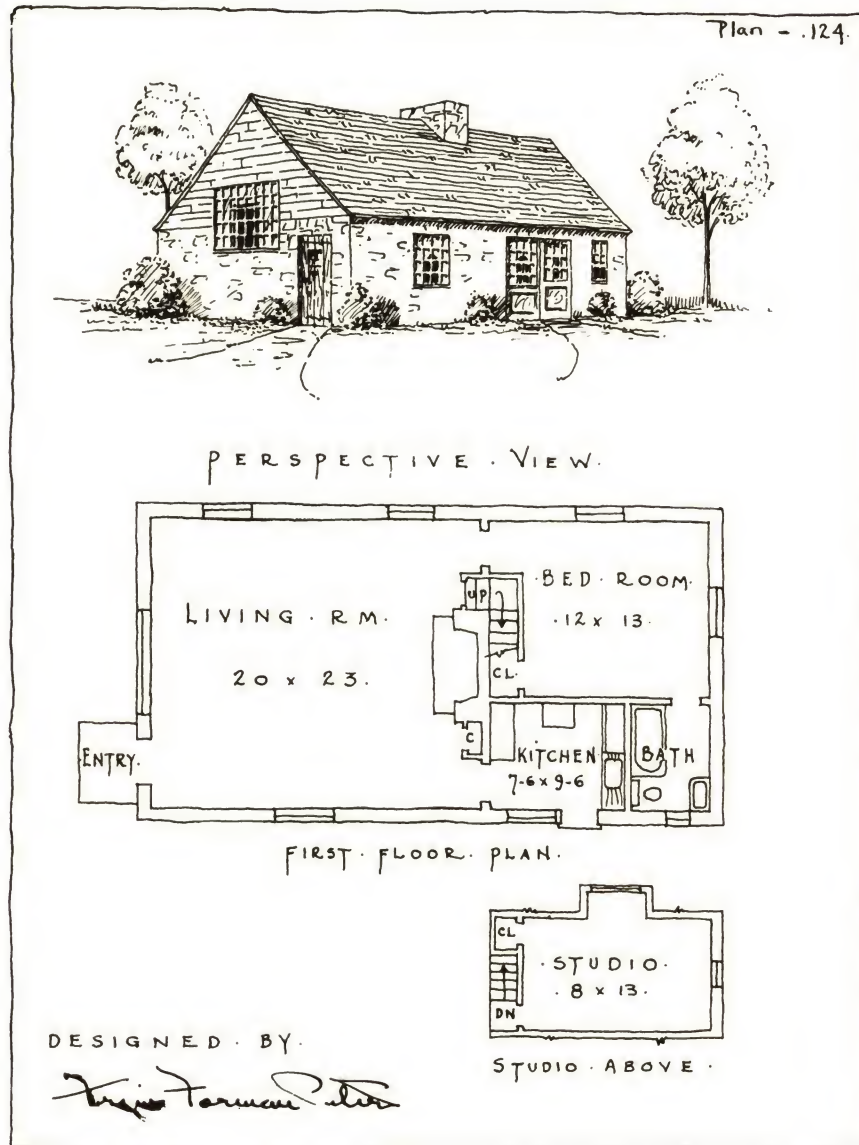
The old woodsman made just as smooth a job as he possibly could with the adze, and though it was irregular, he usually left it fairly smooth.

One sometimes unearths timbers in an old building just as scaley as those made by the modern carpenter, but you will always find that those rough timbers were roughened by the carpenter to prepare them for plaster and were never supposed to be exposed. It is these timbers which are now being flaunted before the public as examples of the old woodsmen's skill.

For my part, I either insist the timbers be exposed in the condition they come from the planer, frankly a product of modern machinery, or that oversize timbers be actually adzed skillfully to the proper size. I prefer the latter, naturally, but would accept any sawed product in preference to hacked up dust catchers.

The other features of the house are usual enough, and anyone familiar with the mode of life of a modern three-room apartment knows both the desirable and undesirable features of this type of house.

Unlike an apartment, however, it can be added to with economy because the units already built are adequate for a much larger house. Due to the smaller width and lower side walls, however, the second floor is not capable of expansion, as it was in 117A, and growth will have to be by addition.



## CHAPTER 15.

### PLAN 122:

I have been continually referring to houses in terms of their possibilities of growth and expansion, whereas some people would like a completed product right from the start. Of course, to me, a house is a living thing, and in designing, I go through these various stages and try to anticipate the future even though, to the client, it represents a finished and final product.

For instance, even though the client for whom I drew Plan 122 insists a Dining Room would be superfluous, I have located the garage so that, should a windfall ever strike him unaware, he can convert it into a Dining Room and the necessary maid's room and bath, at any future time (as per sketch 122a) at very little cost, and without disturbing the original building.

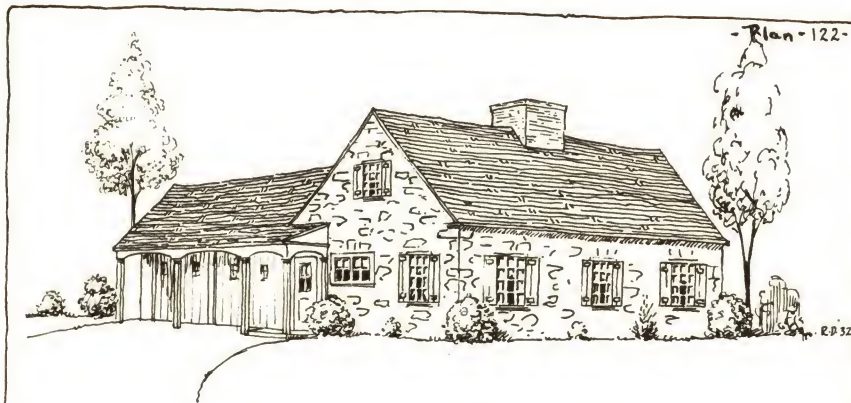
I should have liked to have cut windows from the terrace to the garage with this development in mind, but the possibility is too vague to warrant looking into bare unwashed garage windows from such an intimate place as the family terrace for so long a time. I hope, however, that when the strike is made, it will be large enough to permit this small added expense and that it will not deter him.

His family consists of his wife, two children over 12, and a possible guest. The upstairs bedrooms are intended for the children. If they were still at the nurse stage, I should be in favor of reversing their stairs and taking them from the master's hall, but in the case of children able to look after themselves, I, personally, believe it important for the proper development of all that they be protected from the strict surveillance of their elders, and by so doing, a like gain in privacy is made by their parents.

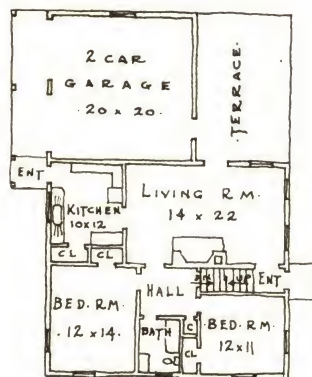
By necessity, children, except where a study is provided, live in their rooms much more than grown-ups, and a pleasant variation, with economy, to the usual bedroom would be given these upstairs rooms by specifying studio ceilings with exposed timbers, as described for the studio of Plan 124.

This plan, of course, is actually nothing more than what we have learned to call a Cape Cod. Actually, though, in type, it is no more Cape Coddish than Irish, French or English. It represents the last word in economy, because it is practically square and due to that, gives many, but small rooms and is, therefore, more adaptable to the larger families of smaller means.

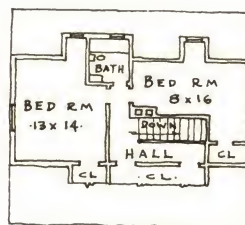




PERSPECTIVE VIEW.

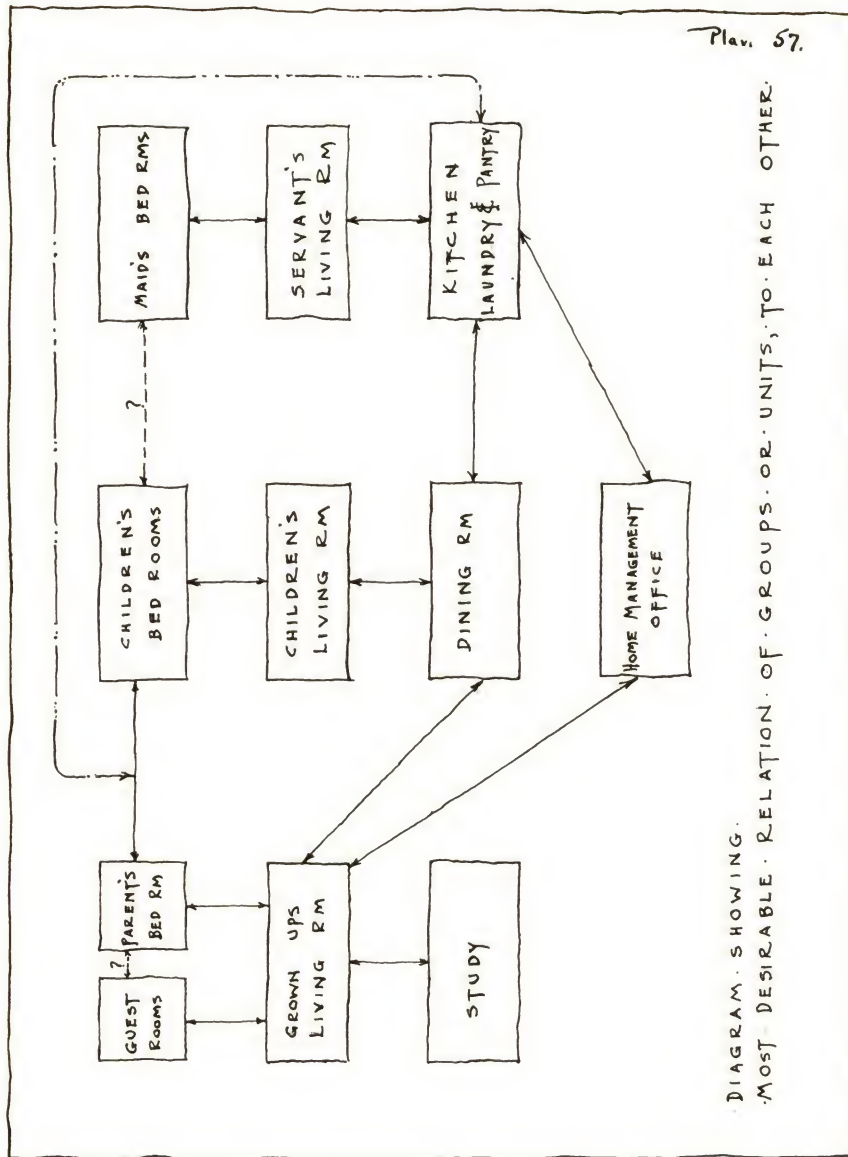


FIRST FLOOR PLAN.



SECOND FLOOR PLAN.

DESIGNED BY: *Frederic Townsend*



## C H A P T E R   16.

PLAN 57: (Photo - Frontispiece and Page 44)

A home, to my mind, should be organized much as a Trans-Atlantic liner is. She has aboard the parents and their guests as Cabin Passengers, the children in Student Class, and finally a crew.

The passengers should be able to enjoy all their various interests and pursuits in just as carefree a fashion as those lying on the decks, eating in the grille, or enjoying movies in the lounge of the Mauretania.

In a ship, the activities of the crew in feeding, heating and caring for the ship and its passengers goes on twenty-four hours a day, but so isolated from the passengers' activities that even the Captain appears to them as nothing more than a nicely uniformed "gigolo," taking romantic poses on the bridge.

If the activities of the various classes of pursuits aboard ship were not separated better than they are in the average house, the Captain, like my Mother, would be continually "shooshing" the servants or forever arranging schedules for the use of the lounge, to provide the peppy students or the dignified cabin passengers with amusements.

This arrangement aboard ship is not necessary for the passengers alone, but for the officers as well. No matter whether the house is run by the man or the woman, it should be planned so that he or she can close his or her desk in the house office and return, as it were, to the family and enjoy with them, in just as detached a fashion, its comforts.

This problem was called to my attention very forcibly when I found myself suddenly with a family of seven children which, the day before, had been merely a fair sized one of four.

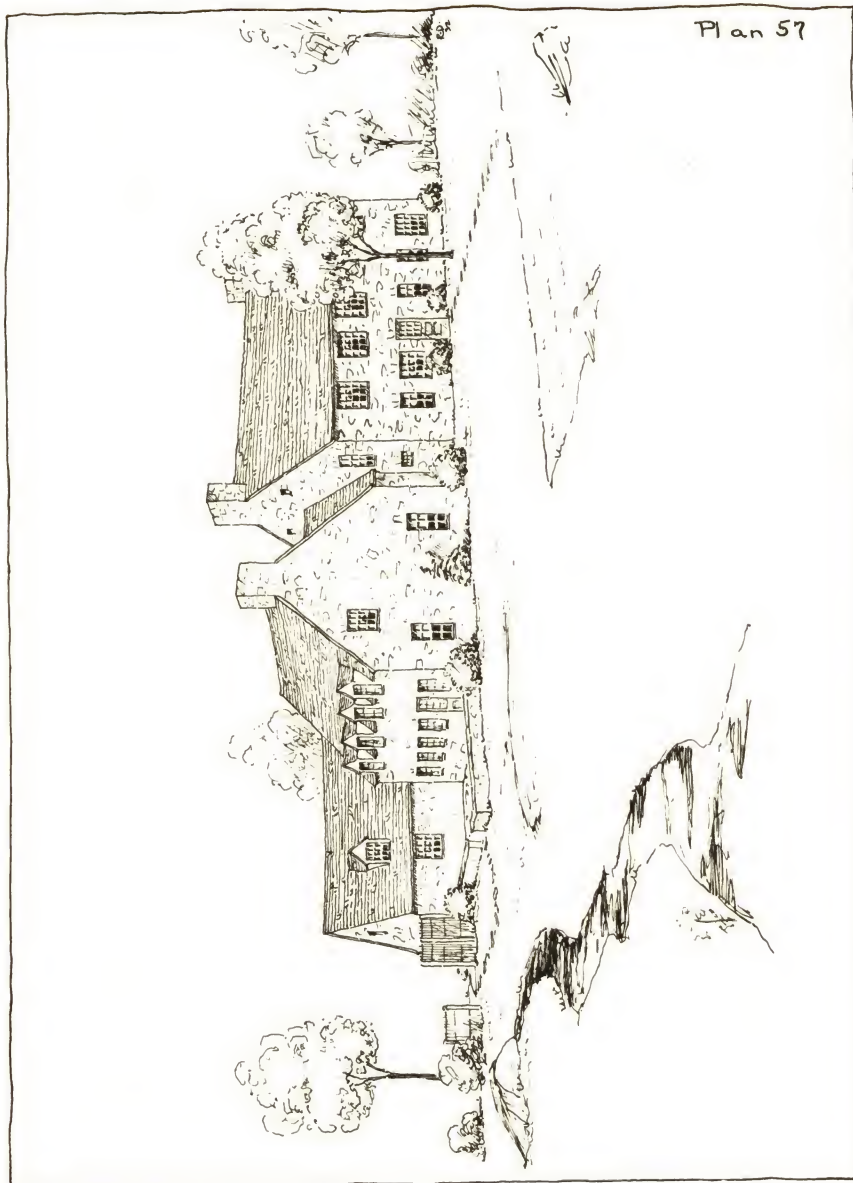
We were then living in an ordinary conventional four square Colonial house something like Plan #29. There was room enough with a little crowding, but no chance for any independent action or thought.

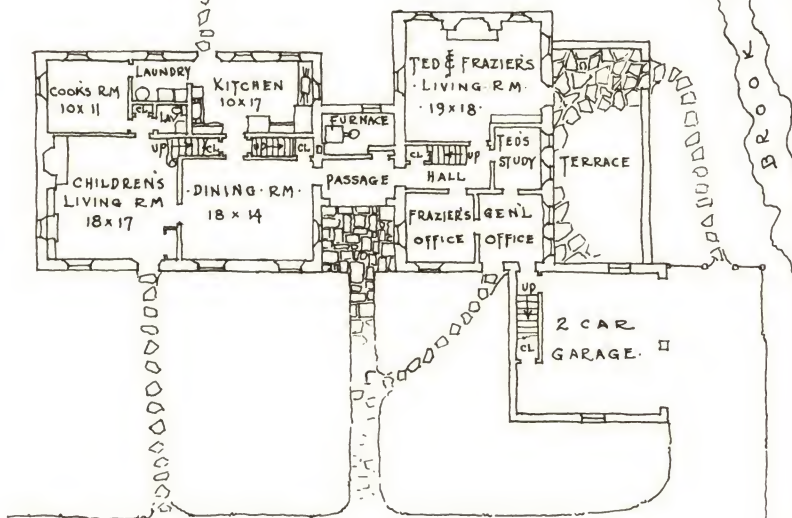
The living room had to be used by both groups, and either group would just get absorbed in reading or chatting when a guest would mean one or the other clearing out. (By group I mean the two main ones in any family, the Parents as one and the Children as another group.)

The children had either then to go to their bedrooms or chat with the cook.

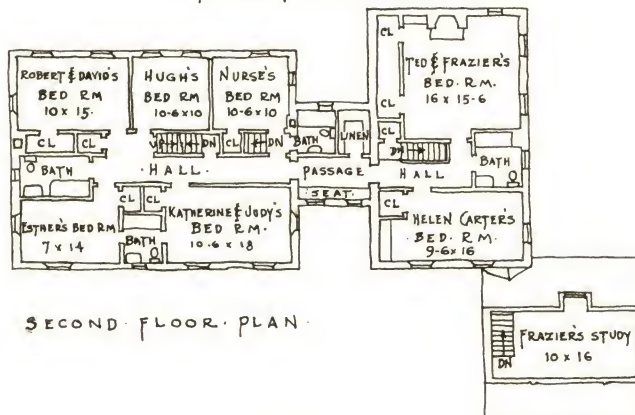
What we needed was a living room for the children. A







FIRST FLOOR PLAN.



SECOND FLOOR PLAN.

DESIGNED BY: *Frazier Farnham*

nursery, as its name implies, is tied very closely to the parents and the maids, and is under close supervision. For children from 0 to 5 years that is all right, but for older children a "sure-enough" living room is the only permanent answer. A room not just to play in, but to read, dance and live in. A room to which their guests can come, no matter how old they are.

Before doing anything on our floor plan, we prepared a chart of our activities to see how we wanted the various groups arranged.

On this chart (Page 49) each square represents one department of the house and the arrowed lines indicate contacts that each department, room, or groups of rooms should have with the others.

The Dining Room is the center of contact, the Parents and Children each through their Living Rooms, and the servants through the kitchen and pantry.

Separate Dining Rooms for parents and children do not seem to me as necessary as separate Living Quarters. While the children are growing up, they have early supper, so only eat with the grown-ups twice a day, which I think is necessary if they are to have proper table manners and a little more liberal education than they can get listening to the servants' pratter.

The Living Rooms of all three are completely separated and connection only made from their bedrooms, the dining room or from the outside. This leaves the children secure from pestering and the grown-ups from a long series of interruptions.

Radiating from the grown-ups' Living Room are the guest bedrooms, the master's bedroom, the study and the home management, or Madame's office.

The children's bedrooms are centered between their living room, the parents' bedroom and, not too directly, the maids' bedrooms too. This leaves the children protected, as it were, on all sides while they sleep, or in case of sickness, but free to let off steam while they play or entertain.

The Guest Bedroom is off by itself with the Parents' between, to protect them from the inquisitive children. Connection with the Parents' Bedroom Hall can or cannot be had, according to personal preference.

The relative location of Monsieur's or Madame's studies is one of personal taste. The home manager, though, should have just as definite an office as anyone in business, and it should be convenient to the mechanics of the house.

We were not able to get perfection any more than anyone else. We were limited as to cash, and though the chart is the ideal, we yielded on certain points as we came actually to work out our floor plan, #57.



Actually we built three houses, or masonry units. The larger unit shown in the elevation and picture contains the children's quarters, while the two smaller units housed the parent activities and their garage. The children's unit is connected to the parent wing by a passageway called by me "the umbilical cord."

The first thing we had to omit was guest rooms. We decided that, for the time being, we could shift Helen Carter (age 3) to Esther's room once in a while as a temporary makeshift and when my business got very prosperous make the garage over into a more complete office, using my present office for a guest bedroom and bath.

The next thing to be eliminated was the servants' living room. Some day our family will shrink, and then we hope to be able to run it on one maid, so we put two maids' rooms in for the present, but located one on the ground floor with the idea that, sooner or later, it would become the maids' living room.

Another reason for splitting the maids' bedrooms in two this way, was to permit of our having a Chinese cook and a white nurse, a combination which has always seemed to me most practicable.

Ted's office (my wife) was a mistake. Working with me as she does, it was located with respect to the business and not the home. As a consequence, she has to do a quick-change act, as the cook desires a conference at the same time as a local lumber magnate. It is so definitely placed now that I do not know if or how it can be changed, but certainly it should have connection with the kitchen as well as my office, so as to make things simpler all around.

We have lived in the house for almost a year and find the children have not gone wild, as some prophesied, with their own living room, but have become noticeably more self-reliant and tend to read and enjoy the quieter interests of life to a greater extent than they did mixed in with us.

Having settled on the floor plan, the next item was interior finish, hardware, etc.

First cost to us was not so important as maintenance. We might be able to build a home large enough to house us, but if repairs and maintenance were high, we would not be able to hold it. Therefore, as each item came under discussion, cost was not considered as important as its effect on maintenance.

For instance, we put in a most expensive type of oil burner because it was economical from both operating and maintenance points of view.

We spent quite a sum of money insulating all the side walls of the house with Celotex and the roofs with Sprayo Flake.

We panelled the walls and tiled the floor of the children's living room, realizing the wear they would have to withstand.

My wife and I prefer white woodwork, but, where children are concerned, it is too difficult to keep clean, so we stained all the woodwork in the children's sections and painted ours, thus not only saving money in the investment, but maintenance as well.

Next to not giving the children a terrace, our greatest error was in the baths. The estimate looked so high that we papered our bath and enameled the others, instead of using tile. A year has passed now, and trouble has already set in under the showers. We saved five hundred dollars but have now to spend fifty for maintenance of something unsatisfactory.

The most surprising thing to most people looking through the house is that it is cellarless.

If I were building on good dry sandy soil I would have put a cellar under her, because so many people expect it, but the particular site I picked was practically a swamp. Even that needn't have deterred me, because cellars can be made waterproof, but since that would cost quite a little more, I eliminated it entirely.

Of course I suppose you wonder why I chose a swamp, with a hundred acres of land to pick from. Entirely due to a little brook. People originally thought we were crazy, but now that the swimming pool is built and the gardens laid out, they begin to see light, and if they heard that water running over the dam every night as I do from my bedroom, they would know even better why I chose this site.

Having decided on a cellarless house, the type of heating plant was necessarily fixed as Hot Water. We located it in the center of things, as it should be, on the first floor, right between the two wings. As a consequence, the burner is not directly under the house and can be reached by the service man without disturbing us at all, which makes for peace and quiet as well as freedom from dirt and oil smells.

The heating plant has been the joy of our lives. It not only heats the house automatically to 70° F, but also heats our hot water the year around without our having to do another thing but turn the taps. Both Mrs. Peters and I can leave at any time for one, two or three days, knowing that no janitor service of a Ritzy apartment could do more than that heating plant during our absence.

Finally, following our own experience, I began in preparing floor plans, to think of the different groups or units in the family organization and their problems in a more schematic way,



and to realize that every house, no matter how small, should be designed from that point of view, rather than just getting so many rooms under a roof and between four walls.





## C H A P T E R 17.

Most people believe that it is more costly to build on a side hill than on a level site. So far as I know, the only difference is in the amount of thought required of the designer.

If you try to fit a house intended for a level site on your irregular lot, of course it is going to cost more ---- more by the amount of material used to provide useless space below the first floor.

It is possible, though, to design a house for a side hill lot, that costs no more per unit of utilizable space than it would on a level spot.

To accomplish this, the house must be draped and moulded on the lot, and not stuck up on stilts.

As an illustration of what I mean, I would refer you to Plans 118 - 129A - 104 and 48.

It is dangerous to give cost figures because of the wide variations in labor and materials. However, in order that you may judge for yourselves in this matter, I am listing below outside figures for these houses which are supported by actual cost records given me by the contractors.

Plan 104 . . . . . \$15,000.00 . . . . . (Fairfield Builders, Inc.,  
Fairfield, Conn.)

Plan 118 . . . . . 6,000.00 . . . . . (Bid made by same firm)

Plan 78 . . . . . 15,000.00 . . . . . (Albert W. Violet,  
Westport, Conn.)

Plan 48 . . . . . 11,000.00 . . . . . (Same as above)

(Fixtures include screens, septic tank, grading, driveway and electric fixtures.)

As the plans are taken up, you will note that space is used even more efficiently than is possible on a level site where a cellar is included. As a consequence, therefore, these houses will tend to be high when judged for the cube basis and low on the basis of utilizable space.

## CHAPTER 18.

### PLAN 118:

People are forever building large, pretentious houses for themselves to live in while they rave, admire and envy at or about the little bits of cottages their less affluent friends may have.

The best real estate opportunity of today lies in small tasteful houses, selling at the price of the "so-called contractors" houses. Thousands and thousands of young and old couples or single men and women are looking for them without success.

The woman for whom this house was designed, for instance, is a school teacher, unmarried, and, incidentally, not to be hurried. For some time she has been renting, boarding, etc., which is most unsatisfactory, and lacks the sense of stability she needs as she reaches maturity.

This type person does not care to put too much money into the house, because life has not yet completely unfolded itself, or reached its stride.

The qualities most desired are intimacy, charm and dignity, even when run servantless.

In this particular plan the lot was the most important detail. As explained later, I believe the lot cost should not exceed one-fifth the cost of the house. In this case, that permitted an expenditure of only \$1,200., whereas lots in desirable sections were all priced at \$2,500. or more.

Lots in ordinary developments could be had for less, but hardly met our requirements because they lacked any sense of individuality.

Finally, however, we discovered a lot in a small subdivision which sloped from the road to land lying to the South. The owner and his family had built on the other more level ones, and feeling this lot less valuable, offered it at a handsome reduction.

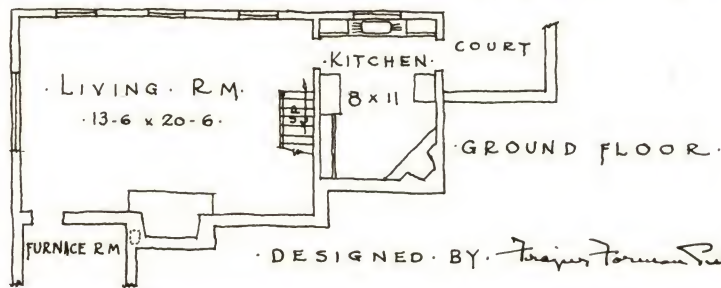
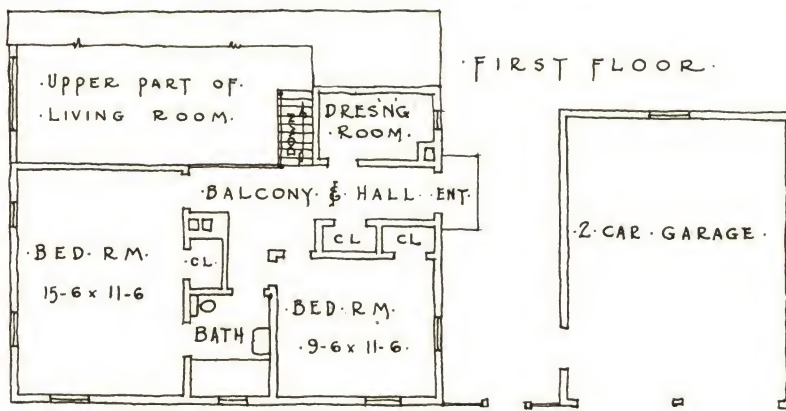
I have always wanted a house with an eight or nine foot stone wall around it, or, preferably, a house built on the front part of such a wall with my gardens stretching out back, protected from everything but aeroplanes. Such a house with rest, quiet and beauty on the one side of the wall and mud splattered walls on the street side, as proof of its intimate contact with the world, is my ideal. Give me a layout such as that, and my choice of locations, and I will select the corner of 42nd Street and Broadway as my site.

Two foot walls, though, are expensive, so out of the question for most of us. But this site, sloping from the road as

Plan 118.



PERSPECTIVE VIEW





it did, offered the same possibilities at no extra cost. It was merely a question of opening the living quarters to the lower level.

Referring to the sketch, you will see how completely the house is cut off from the road, except for entrance, and how even the roof line has been made to conform to the contour of the land. Not one inch of space is lost, nor any cost increased by the unevenness of the site.

The floor plan having been agreed upon, such details as the living room and kitchen were discussed. The living room ceiling would be sealed and plastered, or it could be permitted to extend to the roof to give a studio effect.

"How much more for the studio effect?" she asked.

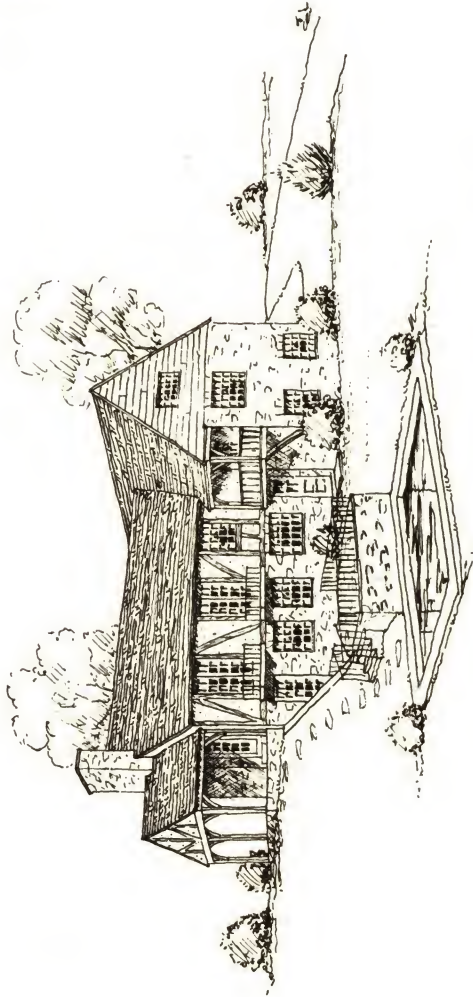
(That invariably is the client's reaction to anything he or she especially wants.)

"No more - in fact, less, and, incidentally, a cooler living room besides."

Sealing the upper part of the living room would involve considerable labor, whereas, as explained under interiors, a pine ceiling, in this case at least, was the most economical construction possible.

When it came to the kitchen I insisted it be made to look like anything but a kitchen. Maybe maids like to look at uninteresting sinks, etc., but certainly if I had to do my own work I would find a way to cook and eat in the same room and still not feel like a cook. So we gave the kitchen a fireplace. No mantel, to collect dust and premium coupons, but a bright red brick fireplace on which bright and cheery pots and pans could be hung. The sink, ice box and stove were all concealed behind simple but attractive cabinets, with bright curtains in the windows, till the whole was a place one could linger in over that mid-night snack or that last cup of coffee Saturday morning.

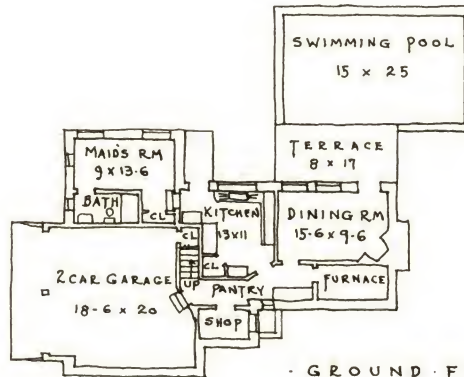
. 129 A .



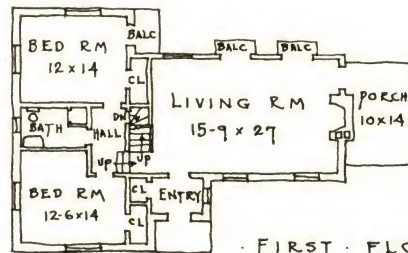
. P E R S P E C T I V E   V I E W .

DESIGNED BY *Frederick J. Farnham*

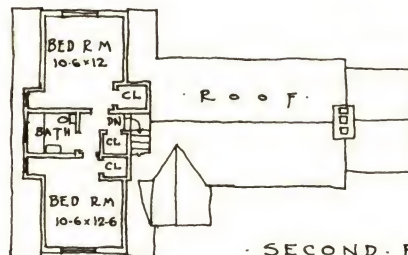
129 A.



GROUND FLOOR PLAN.



FIRST FLOOR PLAN.



SECOND FLOOR PLAN.

DESIGNED BY *Frederic Torrey*



## CHAPTER 19.

### PLAN 129A:

I once owned a Sound View lot, about five miles back from the water. The former owners, in selling it to me, harped on this point and led me to the attic windows to prove it. I bought the house and sold it, never questioning the value of a faint reflection of the sun on salt water, which could be seen at least five times a year, and could be duplicated with five-and-ten-cent store mirrors.

I have seen people pay good money for a view, only to find a year or two later it was to consist principally of a large flickering electric sign reading "It chases dirt," or "It's toasted."

For some people a distant outlook is absolutely necessary, and to them I naturally commend an elevated lot, but not from a sense of logic so far as views are concerned, because even Mr. Rockefeller has found that the only view which can be controlled is that which you yourself own -- if your pocketbook is as long as his, your view can be long, but if it is as short as mine, then it must be kept pretty well within the confines of the small lot on which you build.

This particular plan brings out, better than any other I have done, this very point.

The lot selected by this owner is about 200 feet back from the Saugatuck River flowing through the center of Westport. Judging from the type of house built along it some twenty or thirty years ago, this river must have been most attractive, because all of them are located to make the most of the view over and along it. Now, though, it is a medley of cheap houses, ramshackle sheds, sand piles and warehouses. These houses located for view years ago have been swindled.

This client, being a yachter, wanted to be near the river, even if he didn't want to look at it. His lot sloped from all sides to the center, like a cup. By locating our house, therefore, on one side, we looked down into the center, where we have put the swimming pool, and up the other side, where terraced gardens are to be built. The whole seemed ideal -- the river, the station and town right at hand, and, despite its proximity, a private view, protected for all time from public dumps, sand piles and publicity.

From his living room, dining room, porches and three bedrooms, this owner has a view which may not be distant, but, at least, is as attractive and permanent as he cares to make it.

The house itself offers no unusual features, excepting, possibly, the use of the entire ground floor area for the dining

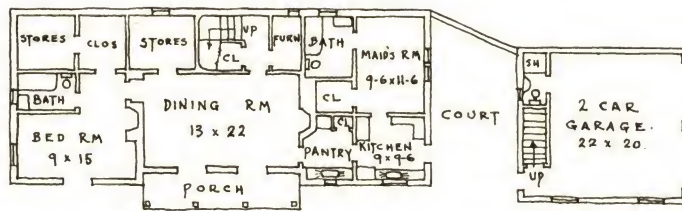
room and service, not ideal in a servantless house, but a distinct advantage in a house of this size, where servants are not a luxury, but a necessity.



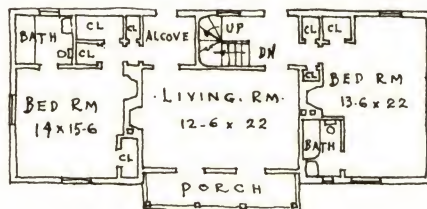
Plan -104-



· P E R S P E C T I V E ·



· F I R S T · F L O O R · P L A N ·



· S E C O N D · F L O O R · P L A N ·

· D E S I G N E D · B Y · *Frederic Townsend*



## C H A P T E R   20.

### PLAN 104:

This plan was drawn to take advantage of a view along the natural front of the house to distant hills. The view had to span two public roads, and privacy was obtained by lifting the whole perspective, as it were, above them.

The driveway leads to the garage, and from there a pair of stone steps take one to the upper level in the rear and thus to the front door. From that point, the house gives the impression of being low to the ground, because it is but seven feet above the upper level. But once inside, the whole opens out, and a sense of elevation is gained as a result of the large windows across the front and the distant view.

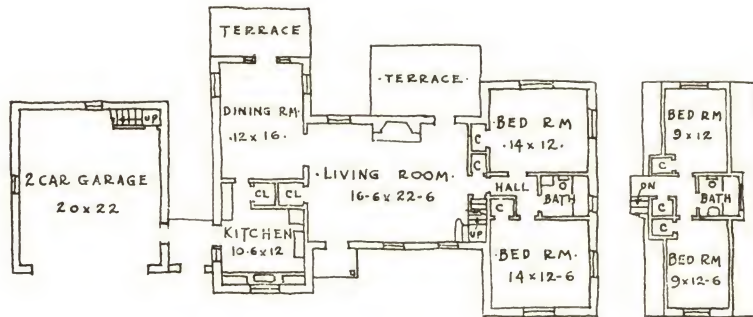
The interior is not exactly what a man and wife with a child or two would want, but is distinctly intended for a group of adults wishing to pursue health and happiness as independently of each other as possible under the same roof.

Baths, closets and fireplaces in each room have been arranged to deaden noises from the living room and make every bedroom a complete apartment in itself.

What a relief it must be, to guests in this house, to feel when they have retired to their rooms, that they are really alone and freed from the conflict of adjustment necessary when visiting.

When I first designed this house I did not show the closets behind the master's bath on the first floor. I was amazed, therefore, when the excavation was complete, to find the contractor had dug out the whole space and contributed the closets to the owner gratis.

To me, it was a vindication of what I have already claimed, namely, that the space provided on the ground floor of a side hill house is the cheapest space in the house when properly utilized.



1ST FLOOR

2ND FLOOR

DESIGNED BY

*Frederic F. Fernald*

## CHAPTER 21.

### PLAN 114: (Photo Page 69)

This house is a straddler. It is not a family house in the sense of a Colonial, and yet it takes a family very well.

It is essentially a house for a group of people, and yet it divides the groups from each other as completely as does Plan 104, the individuals.

The downstairs bedrooms can be used for an intimate family relation by putting the parents in one room and the child in the other, with guests by themselves upstairs, or the child or children can be put upstairs either with or without a nurse, and the downstairs reserved for grown-ups.

The house is so arranged that it can easily be kept without a maid, or the garage developed to house one or two, as in Plan 54.

The keynote to the whole is the living room.

The first house of this type developed by me, was a house now owned by Mr. Paul Windels in Westport, originally built for myself. I craved space. Space for music, and dancing, and yet space in the usual house cost money.

Additional space in the living room of a Colonial house means a wasteful increase in the second floor. But additional space in this type means a little more roof and flooring and a lengthening of the low side walls, amounting to not more than \$50. a running foot. Ten feet additional for \$500.

This room is the center of the house. The exact reverse of the living rooms in Plan 57 (my own house) and not the counterpart of that of the Colonial houses.

The living room in this house is distinctly a community room. Those seeking privacy are compelled to retreat to their own rooms, which, in turn, are both in size and location, designed to give one the privacy he craves.

Madame, when she leaves her kitchen, if she has no servants, leaves it. When she is in her room it and thoughts of it are far away. She does not hear someone fussing in her kitchen or know it is there, as in an ordinary two storied house where she is continually next to it or over it.

This design is what I call a unit design. There is the master's sleeping unit, the living room unit, the eating unit, and the service quarters unit. They can be switched and changed about, as they are in the plans following, but always these various





units are grouped about this one large community room as the center, with service on one side and rest on the other.

Structurally, this house is equally interesting. I believe it represents the most economical stone building providing the same floor area and conveniences that can be built.

It is the most perfectly adapted design for a masonry house that I can imagine which at the same time gives one the sense of space.

Every time I make this statement, I am taken to task, because of the relatively large roof and cellar areas. So far as the roof area is concerned, I can roof a house with slate for forty-six cents a square foot, whereas masonry side walls cost nearer seventy. I can build low walls 4'6" high used on the dining room for forty cents, whereas higher than that, cost nearer eighty, with the added cost of scaffolding and elevating materials. And as far as excavation is concerned, I wouldn't think of providing a cellar under more than the living room, at most.

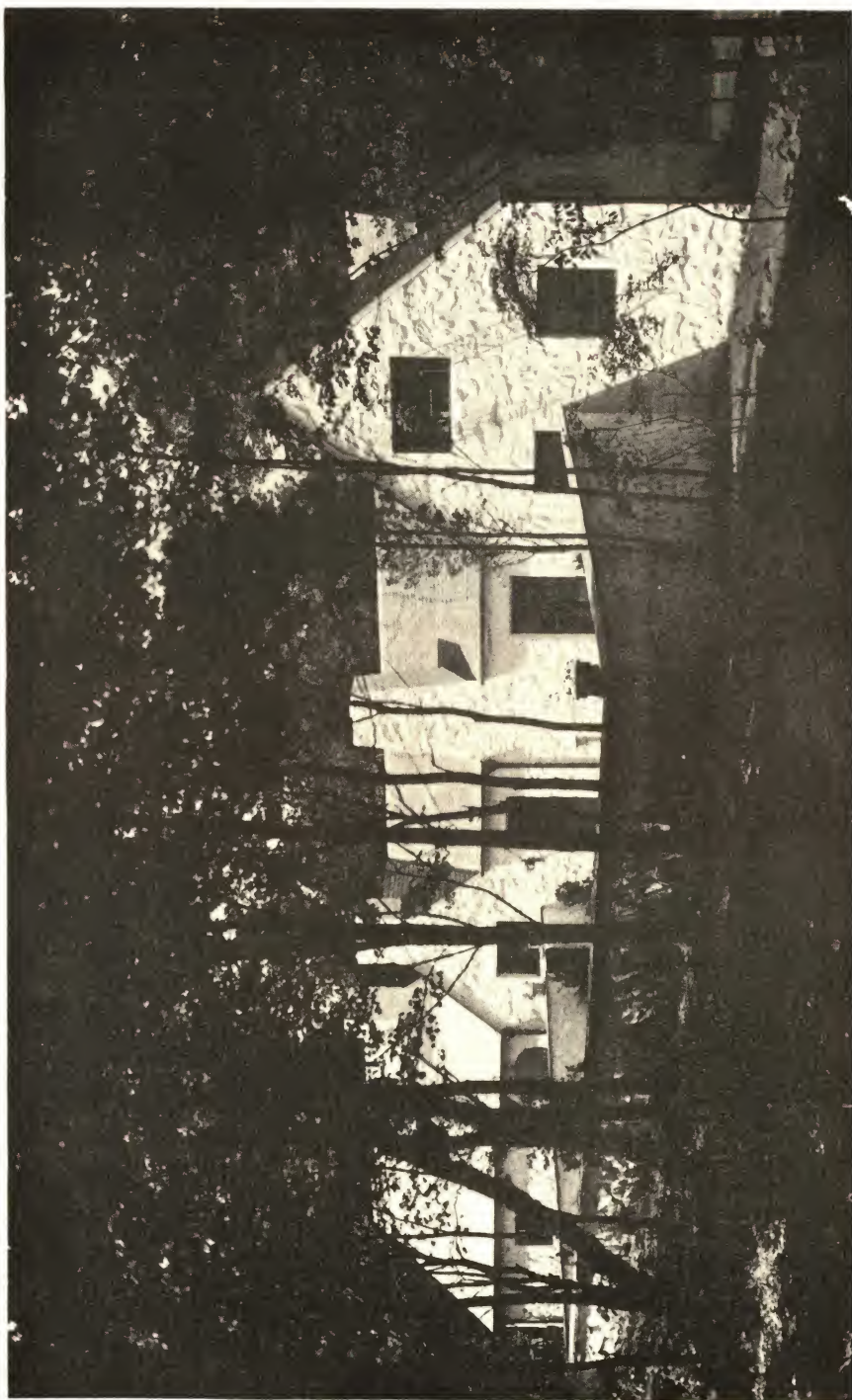
And the most startling effect of the whole house is the interior. From the outside it gives one not the effect of being tiny, but rather fitting the ground snugly. The extremely low side walls on each end, of course, producing this effect. Inside, though, the feeling is lost. The higher walls of the living room side and the fact that a 4'6" wall on the outside gives a 5'6" wall inside reacts to give one merely a feeling of being well covered.

I tried in this house to produce an effect which apartment dwellers miss when they move to the usual two-storied speculative house. It is difficult to imagine anything less private than a New York apartment in which Mrs. Brown's stamping at the children can be heard from above and Mrs. Smith's vacuum rattles and gurgles from below. But neither Mrs. Brown's nor Mrs. Smith's troubles mean anything in your life, and no matter what they do you go on sleeping or resting so long as it is not as bad as a three-alarm fire. But put your youngest son above you, or let a dish drop in your pantry below, and it's a different story. In an apartment, your rooms cover a horizontal area twice as large as in the small house. In an apartment your kitchen is thirty to fifty feet from your room, but in the two-storied house it is probably only ten inches below you.

I never mean to be accused of building bungalows, but, terrible as they are, they fill a purpose. All winter long women live in conventional two-storied houses which means undeniable trouble above or below them all the time. In the summer they look for rest, and the immoral comfort of resting without knowing or caring what is going on outside their own rooms when they have retired.

This house was designed to fill this demand the year round. Not to discourage good housekeeping, but to provide privacy and peace for all at a moderate price.









C H A P T E R 21A.

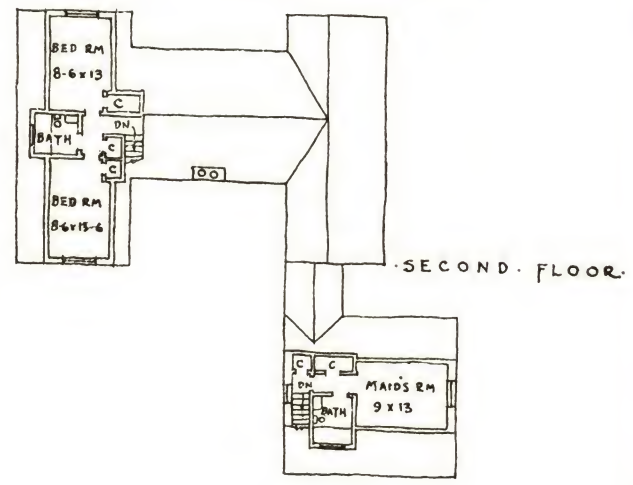
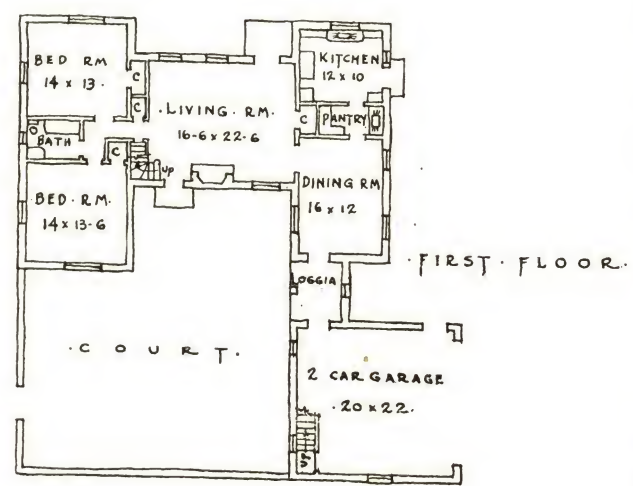
PLANS 54 AND 115:

These are merely variations of #114. A shift of the garage in 115 makes it more adaptable to a small lot, takes the garage from the front of the house, and forms another side to a court in the rear.

Plan 54 is slightly larger in all dimensions, is built in a straight line like 114, but with the garage lengthwise to fit the particular lot on which it was built.

These plans merely show different variations of the unit idea and how they can be shifted about.





DESIGNED BY, *Frederic Forman Sisson*









C H A P T E R   21B.

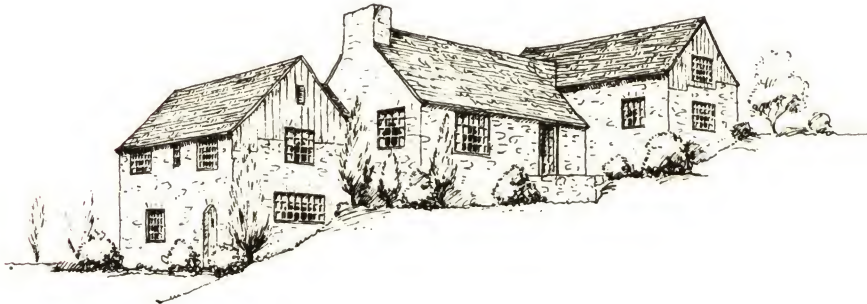
PLAN 48:

The plans discussed for sloping lots to this point have been houses especially designed for the lot. Houses in which the whole was designed to fit on that particular piece of ground.

This plan, though, is merely an adaptation of Plan 114 to a side hill. Each unit is complete and forms one level by itself, with the final precipitous drop in the grade utilized for a garage.

Where the slope is not too precipitous, this plan can be shifted around in many different ways, and I would commend its use to those not caring for architectural supervision or especial plans. I do not recommend such a procedure, but there is less chance of going wrong with this type than any other.

Plan 48



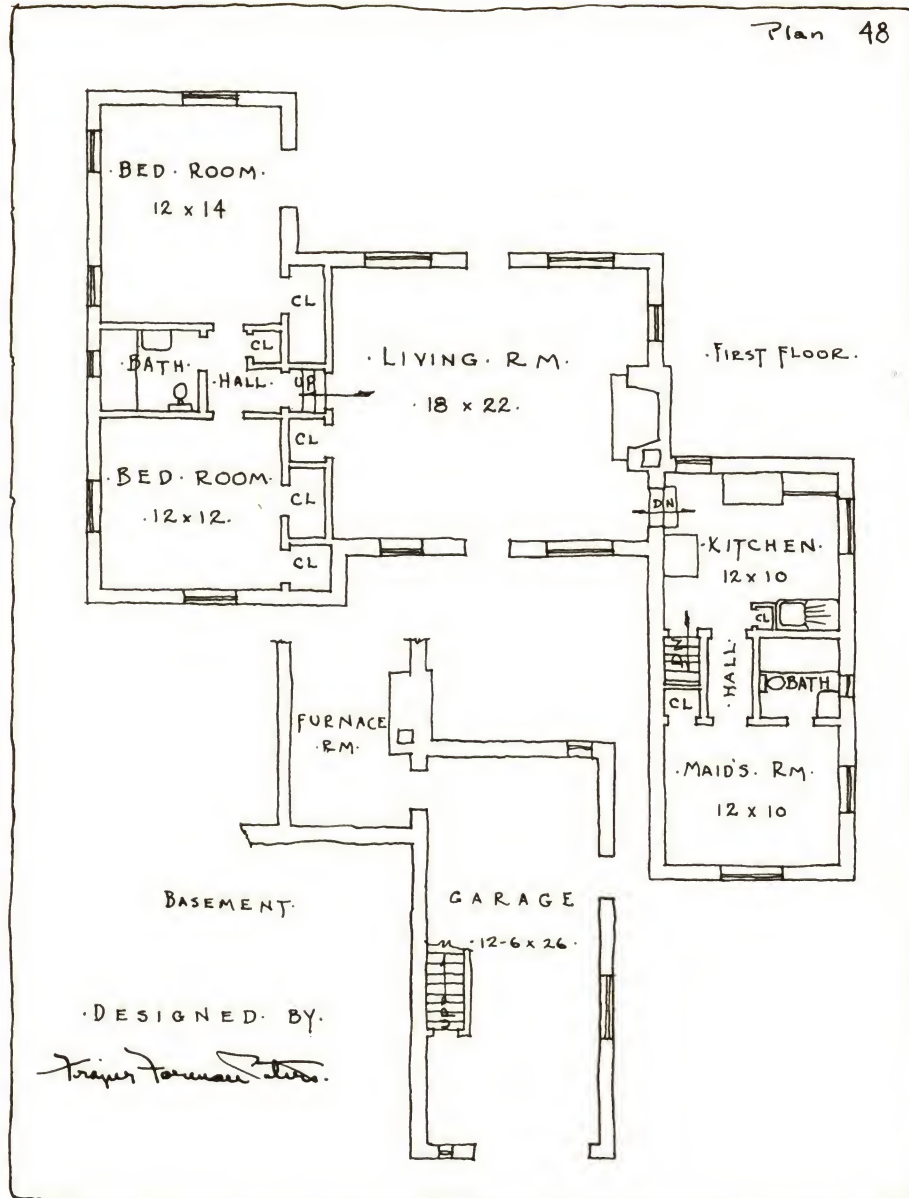
P E R S P E C T I V E   V I E W

D E S I G N E D   B Y

*Frederic R. Tomlinson*



Plan 48





## CHAPTER 22.

Plan 128 shows a small cottage built by me for speculation in Westport, Conn. Its floor plan is very similar to Plan 122 but due to its proportions has not the possibilities of the latter and would never have developed so interestingly if the purchaser had not had such courage and faith in it combined with an exceptionally fertile imagination.

The original house was a simple rectangle with the dignity which only its solid simplicity could command. Nevertheless it was what I have frequently referred to as a house in miniature.

Originally, no serious thought had been given to ever using the second floor for anything except an attic or a place to tuck away some Stags over a week end.

During the first year it was occupied by a couple and was adequate and convenient for their requirements and which, incidentally, was what it was originally designed and built for.

They had hardly left it when we received a mysterious inquiry as to whether it could be altered to accommodate a man, his wife, two children and two maids. The idea seemed preposterous but finally the purchaser agreed to show us how and finally by sheer nerve, we worked out the second floor layout shown on the plans as well as an attractive studio in the garage.

All thru these alterations I realized how short sighted I had been not to have increased the width of the building a few feet so that the upstairs rooms could have been more comfortable and the bath a little less tricky.

I tell you this very frankly because it is a perfect illustration to me of the necessity of anticipating future expansion in the original plan and the principal drawback to houses in miniature. Where waste space is entirely too small you can forget it, but where space is not too small but not large enough someone like Mr. Charles W. Bonner, Jr. is going to come along and not only ask but demand it be made useful.

The furniture had hardly been arranged before both Mr. and Mrs. Bonner began to talk about what they were going to do next. We built imaginary wings here and there but tore them down and tried again.

They were in exactly the same condition as a dog preparing for a big nap, turning around and around for a focus point. The building itself should have had a focus if it had been properly designed for growth but every room being equally small there was no point of beginning so to speak.

While this planning was going on, Mr. Bonner was building



a swimming pool in the back of the house. Suddenly we realized we had what we wanted, our focus point.

A terrace should of course face South, but the front door and roads made both the South and West impossible. But the swimming pool settled it. For geographical reasons it had to be on the North so somehow we all forgot exposures and developed the rear instead by building the terrace and living room to overlook the pool.

Plan 128A shows the final result and except for a children's living room has everything in as nearly perfect relation as possible with the exception of the maid's bath.

The Living Room is completely covered with random width Pecky Cypress excepting the fireplace and balcony breasts which are plastered, thus giving an interesting contrast.

In order to get a fair sized master's bedroom over the balcony section of the Living Room and yet not carry the addition too high in relation to the original house, it was necessary to drop the level of the addition about 2' below grade. The effect is good and despite warnings of dampness etc. by our mutual friends, no difficulty on this score has been encountered.

I had not expected any, tho, because I had just been reading an article in the National Geographic about Icelandic houses. Tradition tells us to keep our artificially heated houses up to keep warm and avoid rheumatism. Practice has taught the Icelanders to dig theirs into the ground for the same reason. Which is right, I am not sure, but since the Bonner's are not bothered with either dampness or rheumatism, I suspect the Icelanders had pretty good sense.

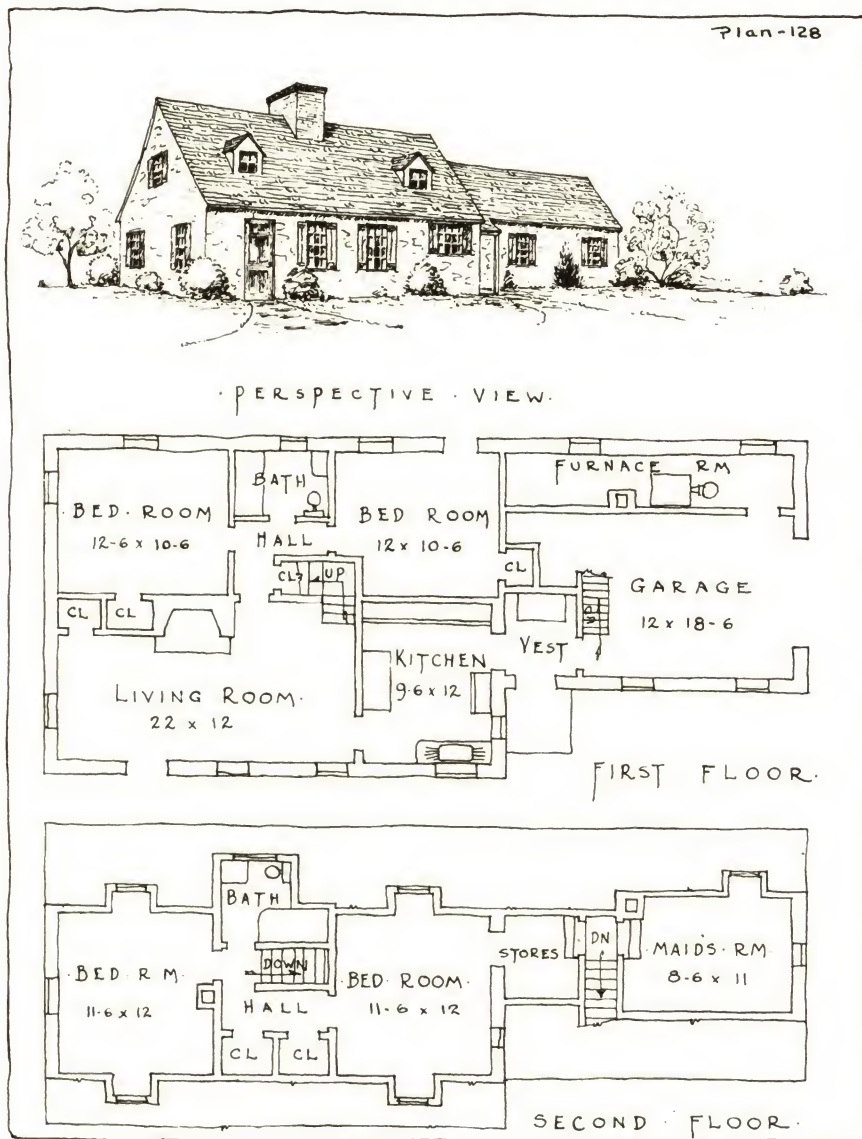
Hind sight is always better than foresight and along with many other things I learned while doing this job was that panelling of any kind should always be backed or laid over an insulating or plaster board.

With our damp summers and drying heat in winter, there is bound to be a large shrinkage between the boards, not objectionable except that it causes draughts, due to the small air leaks that are bound to occur at the plate. Sprayo Flake applied along the eaves reduces this somewhat but not entirely, whereas a plaster board behind the panelling eliminates it entirely.

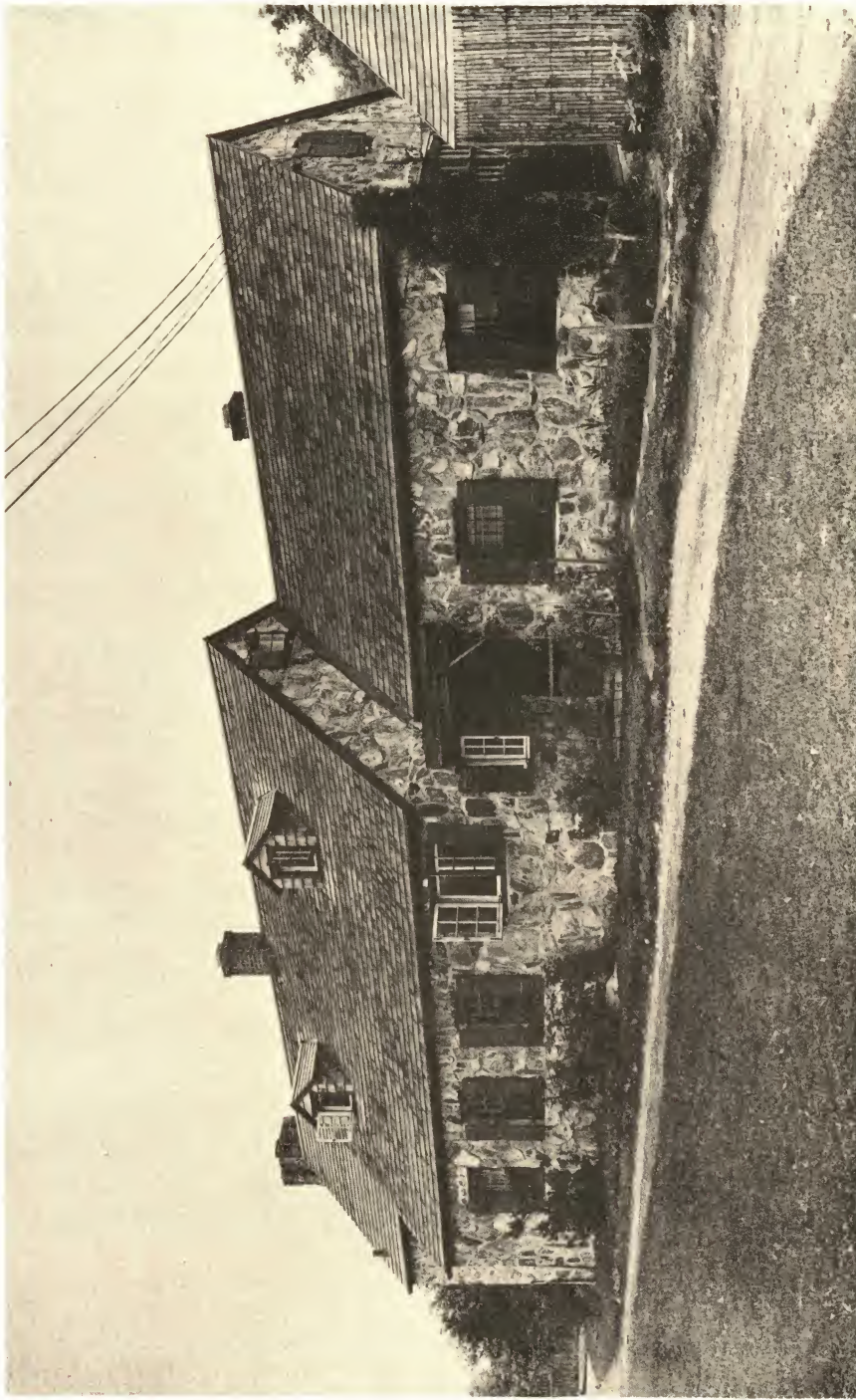
To me, a designer and builder, this house has been a fascinating study because of the vitality its owners have given it.

To them it is a living thing that should grow with them. Hardly a week goes by without some small improvement or addition. Those additions and improvements could come from me, a mercenary, and stamp the whole building with that indelible stamp left on a room by an interior decorator. But emanating from the owner him-

self the ideas have novelty and utility and necessarily give such character to the building that I, for one, am proud to sit back and listen, do as I am told, and enjoy the result.

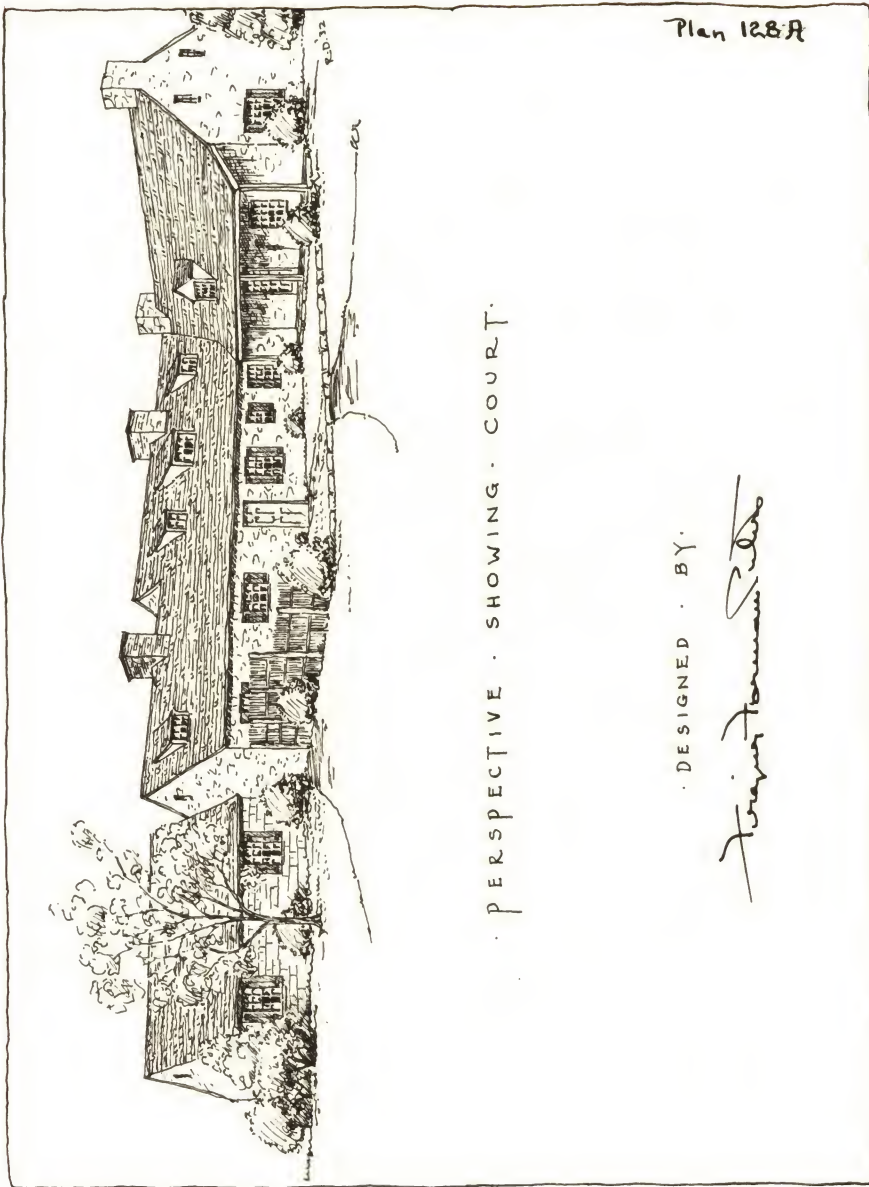












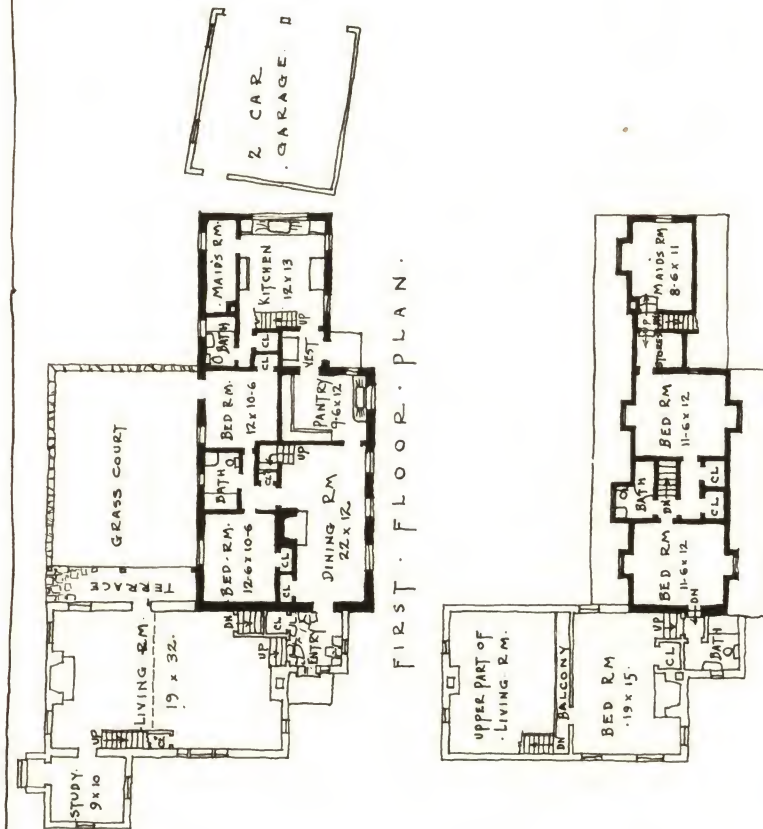
PERSPECTIVE · SHOWING · COURT.

DESIGNED · BY ·

*Frederick Thomas*



Plan 128A



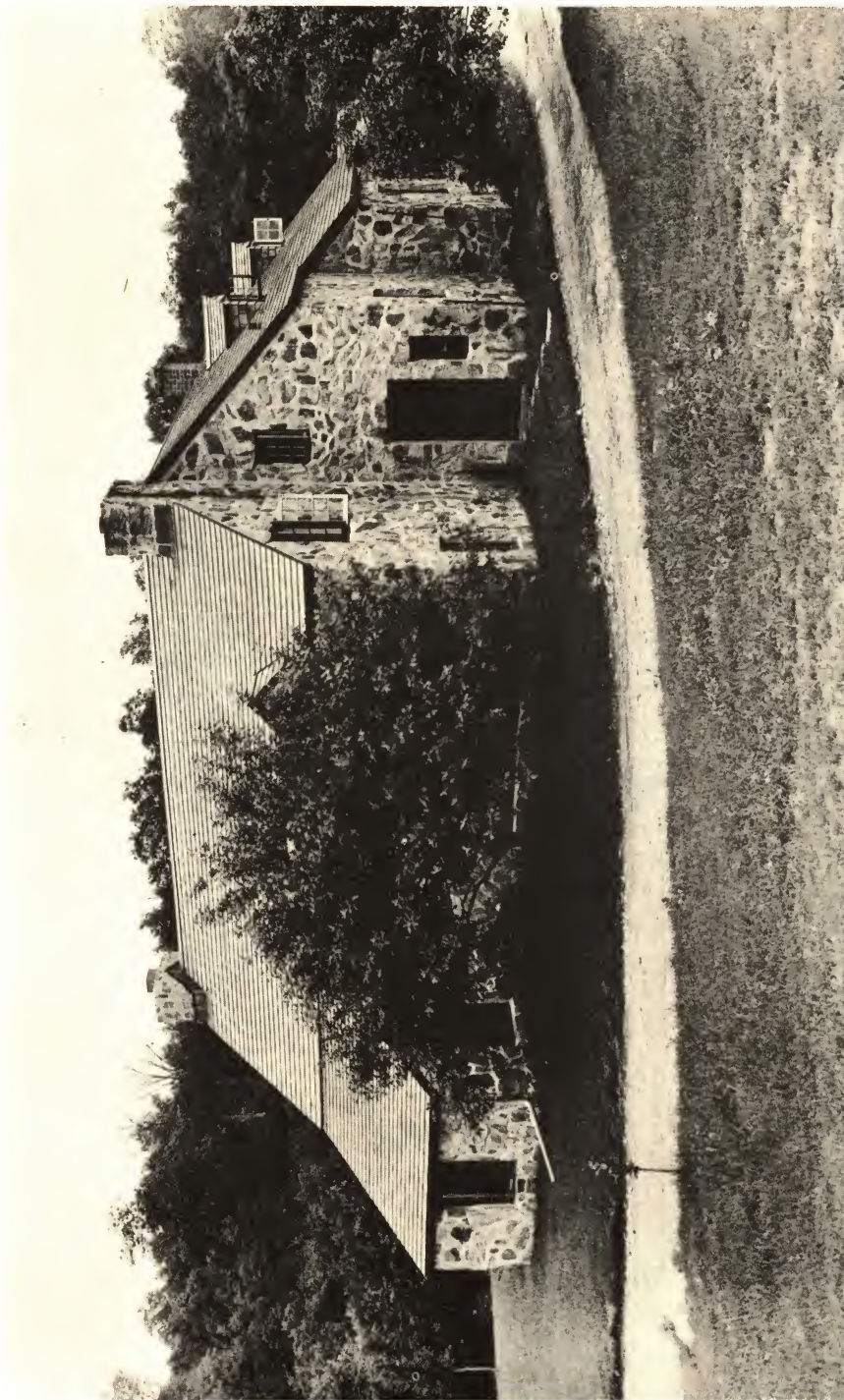
FIRST FLOOR PLAN.

SECOND FLOOR PLAN.

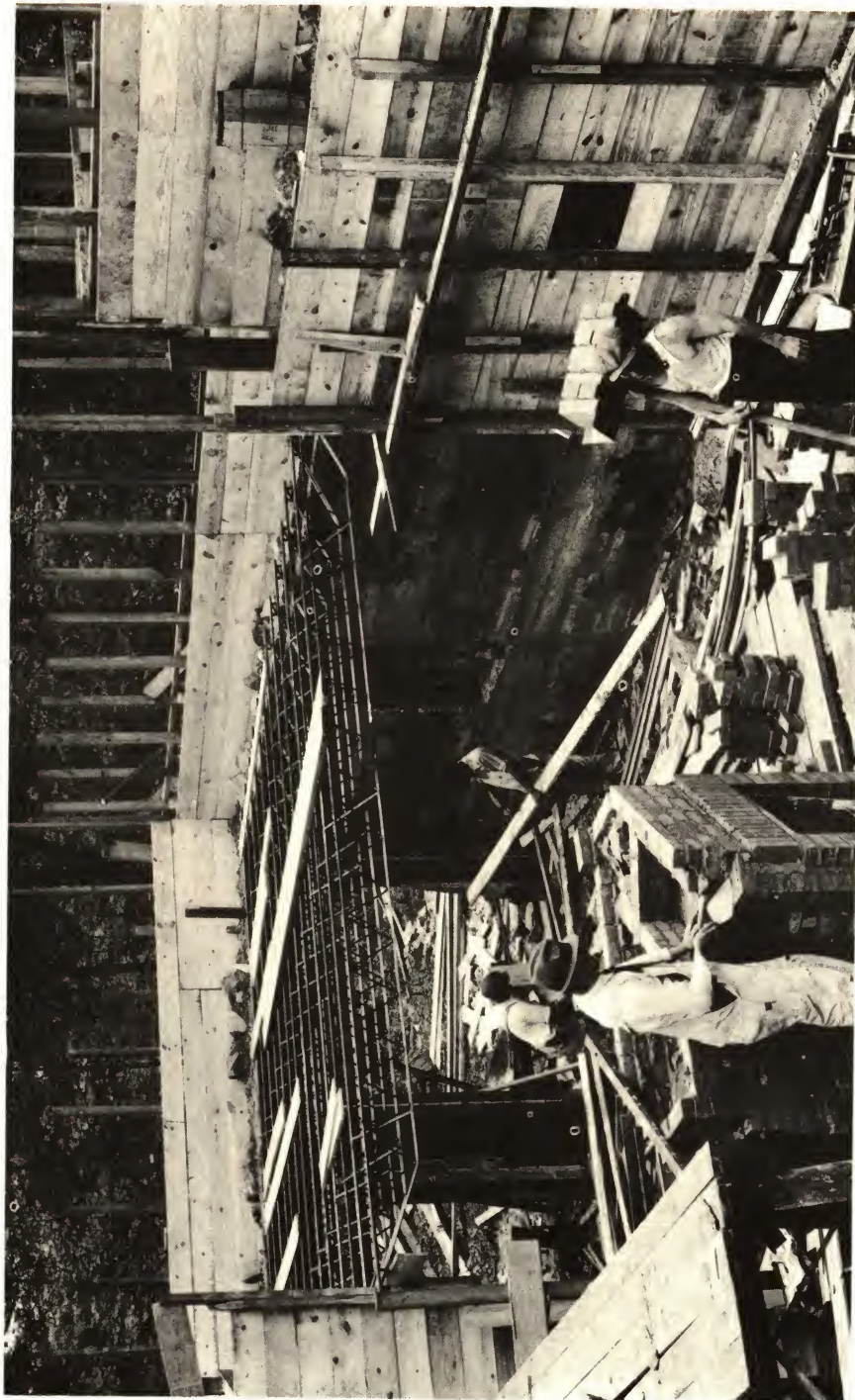
DESIGNED BY.

*Frederic Tomlinson*









## C H A P T E R   23.

### PLAN 68:

This house, built in New Canaan, is a variation of two built on Chestnut Hill, Wilton, Conn., and again on Gravel Island Road in New Canaan.

I am always a little surprised to find that laymen never see the connection. For my part, they are the same house and started at the same point as my first house on Old Hill Road, Westport. Each person, though, has had his or her own preference about this or that detail or details, and the lot has dictated certain changes, so that when it was finished it had a new personality and so became another house.

At another point, I have referred to Colonials as being as alike as peas in a pod. Most people take issue with this, because they do not see them as I do. A window shifted here, or door there, to the layman makes a different house, but to the builder it makes it no more a different house than changing a shoe lace gives you a new shoe.

It was designed first for the parents, as it should be, secondly for the children, and finally for the family.

The parents have first their large bedroom and secondly their study to retreat to with guests.

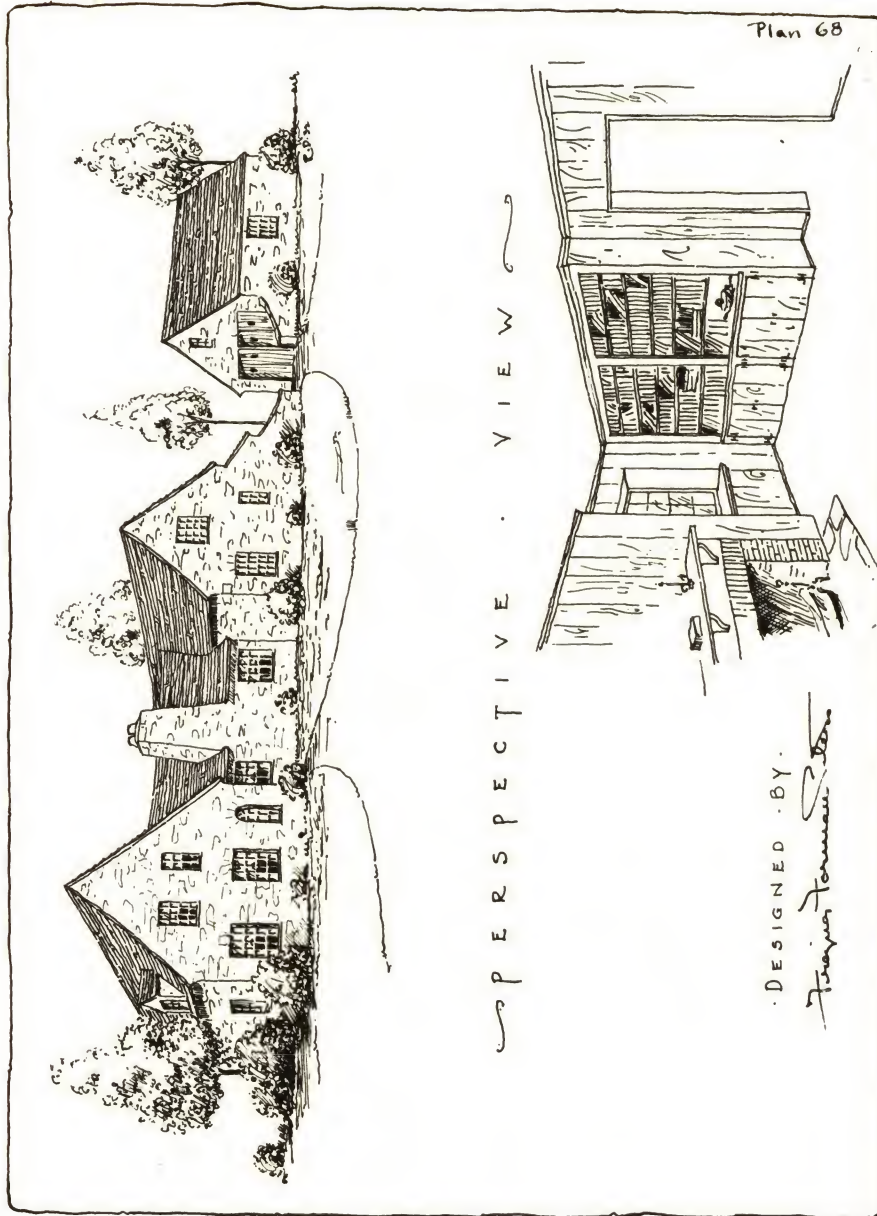
The children have their bedrooms on the second floor where they can disturb no one but the poor guest in the larger room. These are small rooms, to be sure, but children prefer them. They somehow fit better.

And the family together have the living room. A room large enough to take two pianos and to take a big party without the slightest crowding.

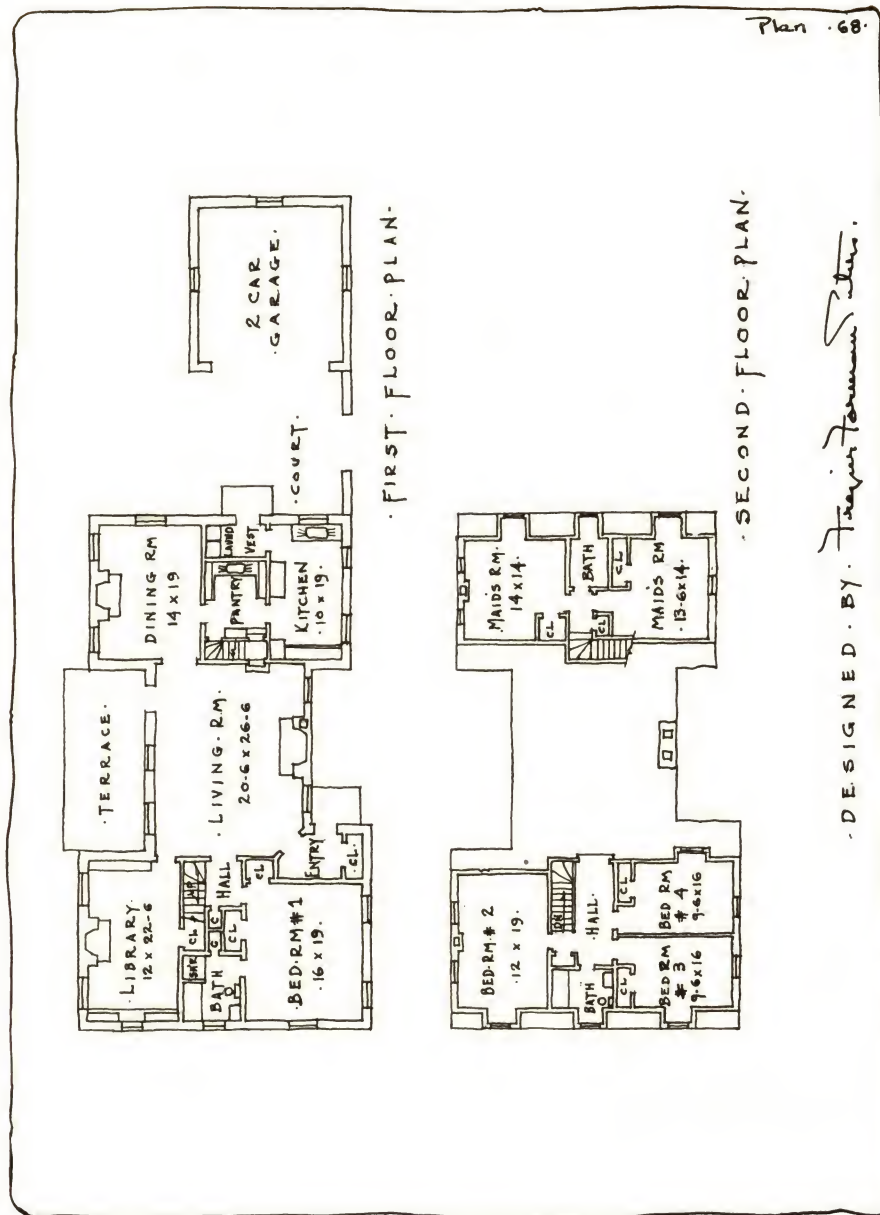
Many unexpected things happen, and this living room was one. About the only complaint I have never had in feeling my way in building was one on acoustics. Had I tried to get them perfect, I would probably have done everything backwards, for awhile, until I had worked around to standard practices again. Well, this room has become a sort of music center for both pianists and singers. It takes music as perfectly as any I know. I believe the combination of the open rafters and the roof deadened with Cabot's Quilt are the cause, though it may be just a matter of proportions. At any rate, asked again to produce the perfect concert room, and I shall copy this one.





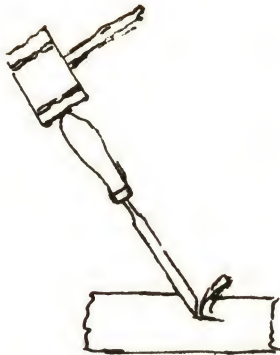








## CHAPTER 24.



"CHISELING" not Jig Saw puzzles will be recorded in History, as the indoor sport of 1933.

"CHISELING," tho, especially in building, is uneconomic, dangerous, and not basically corrective.

Mathematically, efficiency is the ratio between what is actually accomplished as against what could be theoretically.

The efficiency, therefore, of an Architectural form would be the ratio between the livable space provided as compared to the actual cubical contents enclosed by the roof and side walls.

To meet the 1933 demand, I decided to make a study of the relative efficiencies of the Architectural forms being used in small house design.

To illustrate what I found, I have shown diagrammatically in the figures, the profiles of four types of houses, used as the basis of most house designs in this area.

Type 1 is the Cape Cod and Type 2 any two story house but more particularly what I call the "four square Colonial."

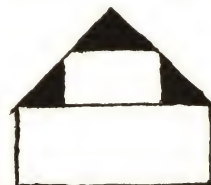
In these diagrams the shaded area represents useless space and the unshaded areas utilizable space.

Attic space is regarded as lost space because it is uncontrolled, inconveniently located and is a by-product of the design.

If storage space is to be provided, let us do it frankly where it is more convenient and incidentally cheaper.



Type 3. 80% Eff.



Type 1 - 77% Eff.



Type 2 - 67% Eff.

A study of the figures is quite interesting. In the Colonial house (Type 2) for instance, we pay for 32% more space than we

can use and the Cape Cod (Type 1) is only slightly better.

The so-called "Contractor's Dutch Colonial" (Type 3) is better but despite its false lines and terrible proportions is only 80% perfect.

These cheap contractor's houses, which dot the countryside, have always been one of the seven wonders to me. It is perfectly evident that they were after economy but only partially attained that and to compensate for its loss have nothing but awkward and ridiculous proportions to show.

Set well back from the road, near Greenfield Hill, Conn., is a true Dutch Colonial built during the Civil War. It is one of the most attractive houses I have ever seen and as tho to guard its secret, it is completely surrounded by huge maples, which defy the camera.

It is still occupied by its original owner, an old lady of over a hundred years. She and her husband built this house of timbers he had cut and brought with him from Poughkeepsie.

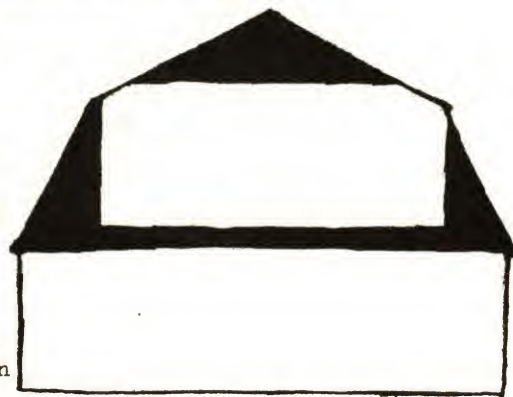
They wished to produce a lovely, dignified home, as sincerely as we do today, but they also wished to produce a home at a price which did not wreck their own security in its fulfillment.

Today, we have all come to much the same problem. Frugality has again become a virtue, and this plan shown in the following renderings offers the same advantages in 1933 that it offered in 1860.

Why our Contractors have veered off to less efficient Gambrel types, I don't know. But I do know that except for the cube, there is no Architectural form more efficient. In it only 14% of the space is lost and of that 14%, at least 5% can be used conveniently for built in drawer sets, closets, etc.

This then gives us a running start over all the other types of houses, except the cube, of from 32% to 6%, and then if "chiseling" is the order of the day, you can start from there at least a jump or two ahead.

The material and labor necessary to build this home (Plan 300) including all labor excepting mason and carpenter but including oil burner, grading, etc.,



Type 4- 87% Eff.



will cost \$4,200.00 which means that the completed house can be built in stone with slate roof for \$5,500.00.

Contractors taking this house at this figure can make a reasonable profit even tho the standards are raised because the low cost is gotten, not by "chiseling," but by an actual reduction in the material usually necessary to enclose the same number of rooms.



## CHAPTER 25.

### PLAN 151:

Many times when I have been designing for a client, the question has arisen, as to whether a studio ceiling was as cool or cooler than a lower one having an air space between it and the roof.

In designing this house for Mr. O. B. Hanson naturally this same question came up. In fact it came up doubly strong as I was trying to talk him into the same type ceiling for the two second floor master bedrooms.

As explained in Chapter 31 these pine ceilinged studio roofs are constructed as follows. 7/8" White Pine boards are laid directly on the 6x6 rafters to be exposed below. Over this is laid Cabot's Quilt which in turn is covered by 7/8" Sheathing on which the slater's felt and slate is laid.

I have always found these roofs entirely satisfactory but still it took Mr. Hanson to get exact information for me.

By inquiring of Insulation experts he first found that Cabot's Quilt is one of the very best insulating materials made because it is continuous and because it has many trapped air cells. Asbestos slabs one or two inches thick of course surpass it but none of the half inch insulating boards do because of their greater density and smaller number of dead air cells.

He next learned that this roof as a whole was a better protection from the weather (i.e. hot and cold) than an ordinary roof with an air space and plastered ceiling because of the very fact that there was no air space.

Dead air, this insulation expert told him, is a marvelous insulator. But you never have dead air in a space deeper than six inches. Therefore by pushing the ceiling, as it were, right against the roof you have helped matters considerably.

This point had never bothered me because I have always believed (as I have stated before) that rooms built into the roof need not be hot if properly ventilated.

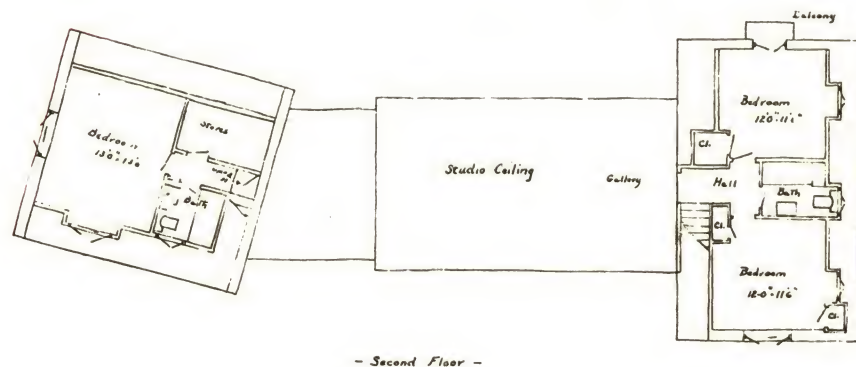
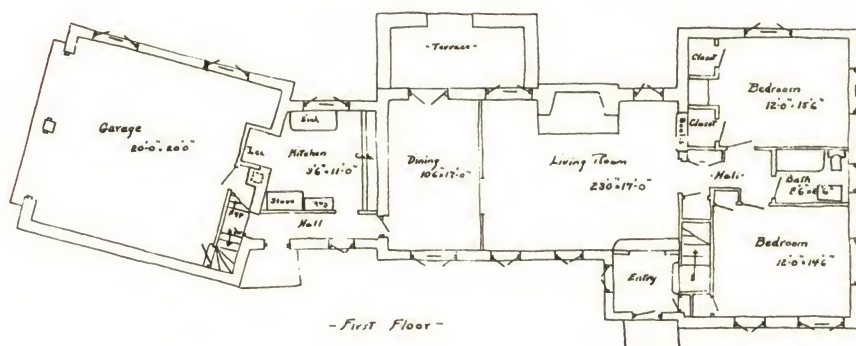
Hot air rises. Provide an outlet near the peak of the room and it is bound to escape as quickly as it forms.

In this house, for instance, the living room is automatically ventilated by the hot air generated in the Living Room flowing thru the second floor balcony to the rooms on that floor. These rooms have adjustable louvres at their peaks thru which it in turn escapes outside.





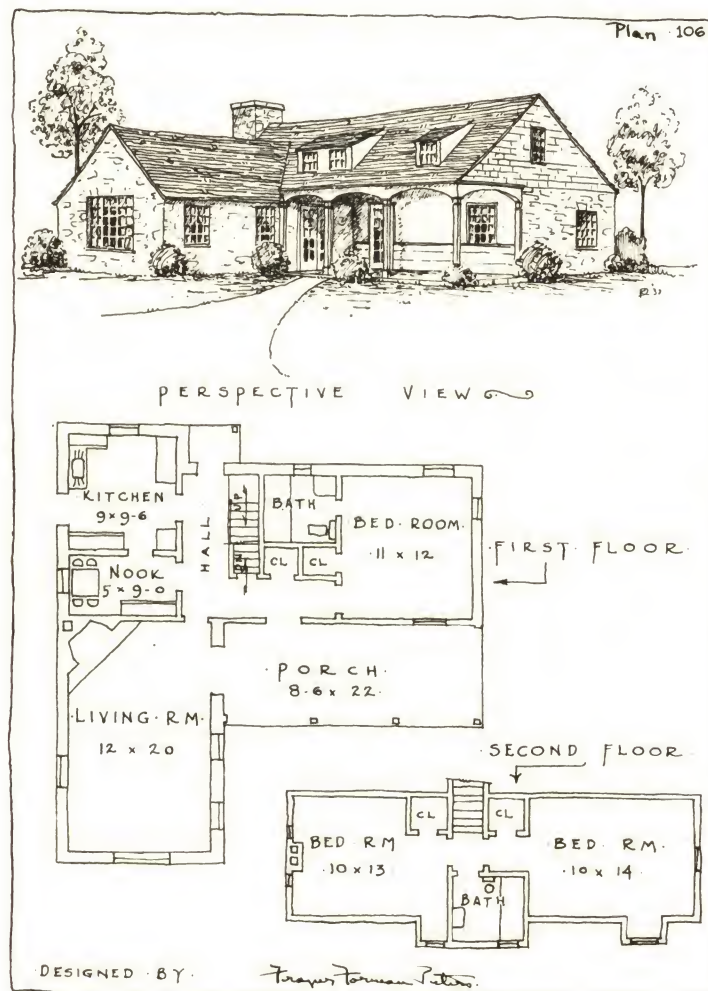
- Plan 151 -



Does it work? Well, on May 29th the slate on the roof was over 180°F. The temperature in the living room at mantel height 79°F. In the bedrooms 85°F with the louvres closed and 81°F with them open.

The Pine Ceiling with the sun shining on it was about 5° warmer than that in the shade. Yes it works. But before the summer is up Mr. Hanson, with his flock of thermometers pasted to the roof and ceiling, and his passion for facts, will have more detailed data and possibly suggestions.

Then I hope we will know exactly what to do to keep attic rooms cool in summer and warm in winter, a problem important to all but especially to designers of stone houses with their characteristically low walls.







## CHAPTER 26.

### PLAN 203:

Man or at least this small part of him is essentially lazy. For years I have been fretting - and explaining why a house built over-strong, and of the best materials is bound to crack and heave at the end of one or two years.

Settling, the layman calls it. In fact he calls anything settling that causes anything. Settling and shrinkage, tho, are quite different. Settling is inexcusable. Shrinkage unavoidable where wood is used on the interior frame.

Shrinkage is not a problem in small houses but where wood floor joists and partitions are used on the interior of a large house the shrinkage may amount to from one to three inches in the center of the second floor.

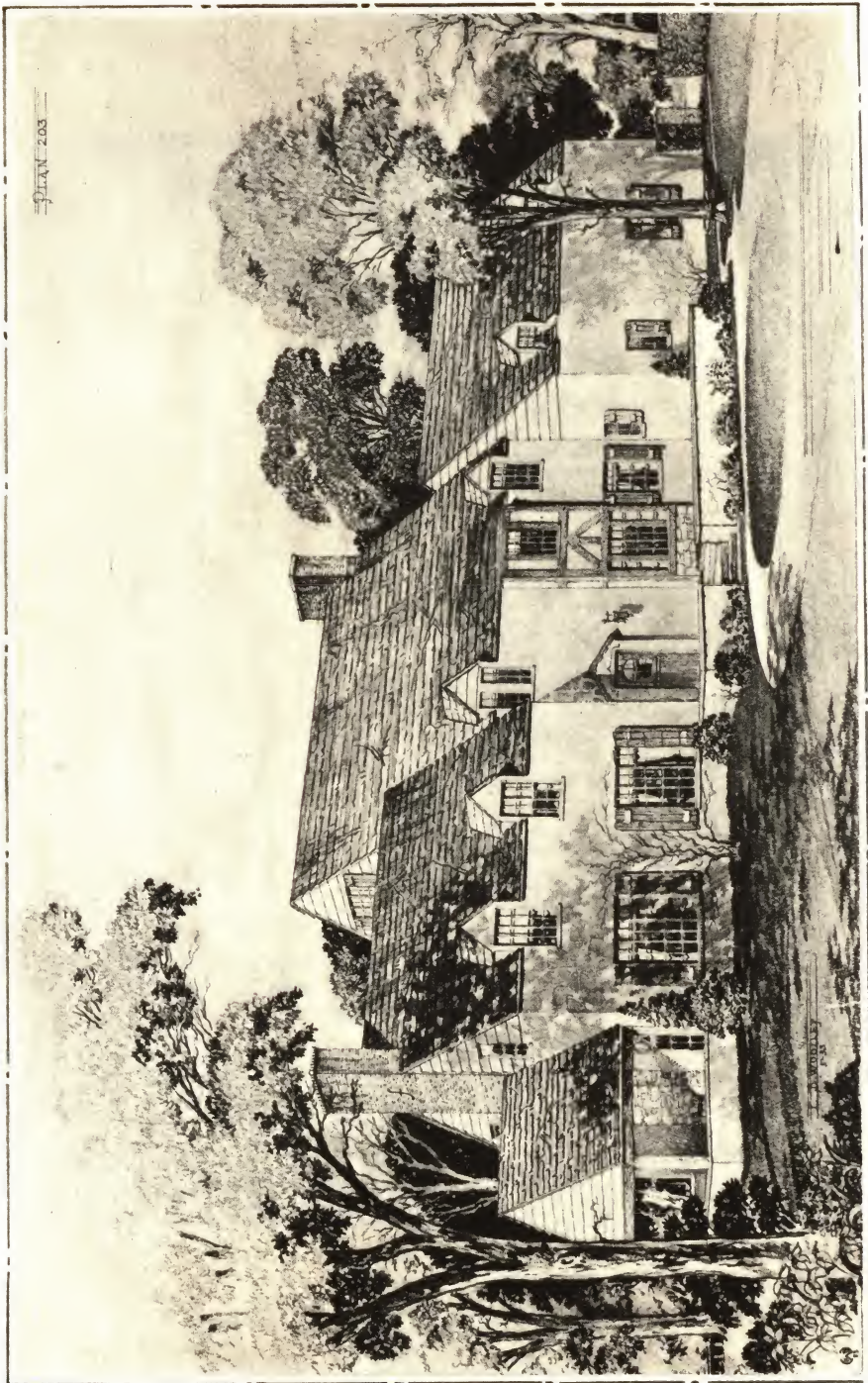
It cannot be avoided. Seasoned lumber is not the answer. Heavier joists will not shrink any less. It is the nature of the beast. Wood swells in damp weather and shrinks in droughts or under the influence of steam heat.

So along comes 1933. We begin to grope for new ideas and improvements and finally we hit on steel floor joists.

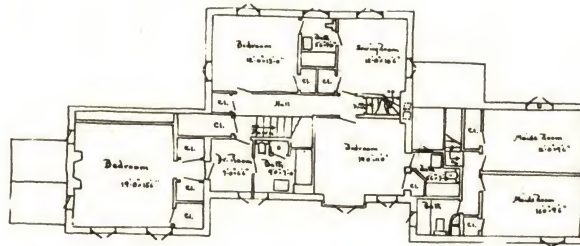
Not new. But new in houses of this size. Steel joists on first and second floors - steel overlaid with concrete - bearing partitions of concrete blocks. A combination that defies termites - that resists cracks - and still permits of the combination of a white-washed stone exterior with lines and forms we have learned to classify as a home - as against those equally sturdy steel and concrete modernistic types which still seem so raw and new to most of us.

It was a thrill to me to see the first steel set in place (Page 88). These houses are so fundamentally sound in themselves that they are always leading one on to improve and keep improving their lasting qualities. What the next step will be, I do not know. Each one is a new experience. Unless each is a step forward it is a disappointment - a loss. But this house finally combines the same lasting qualities inside that it has out.

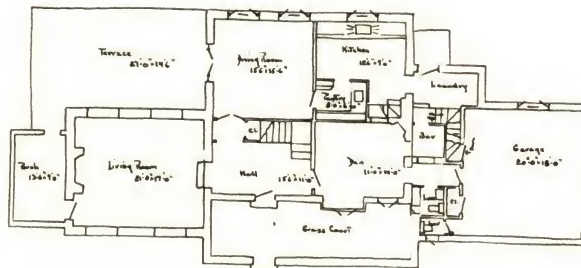




- Plan 203 -



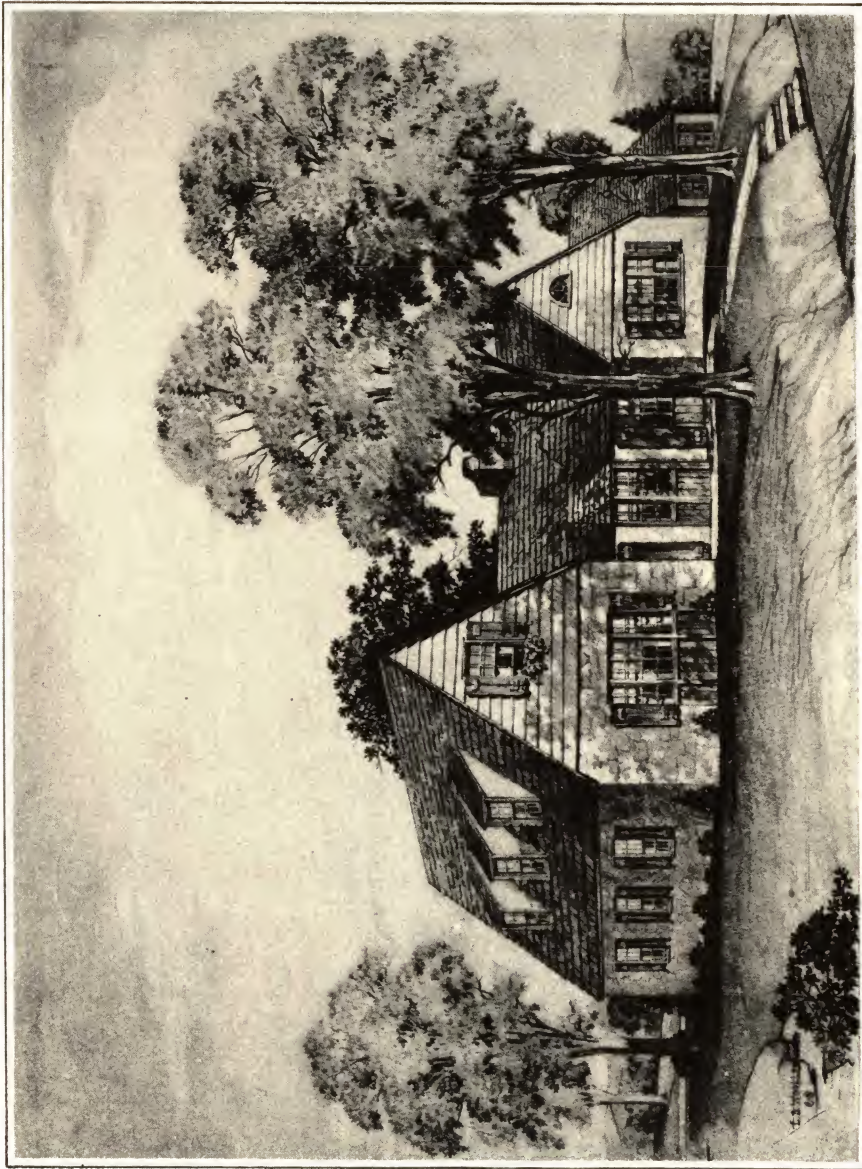
- Second Floor -

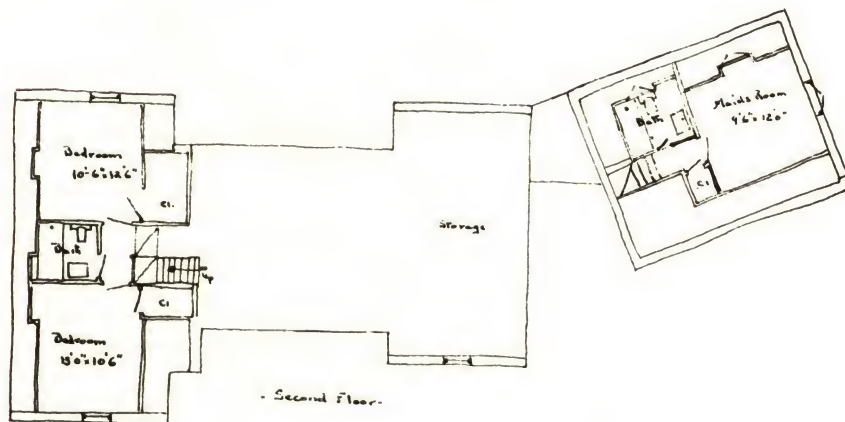
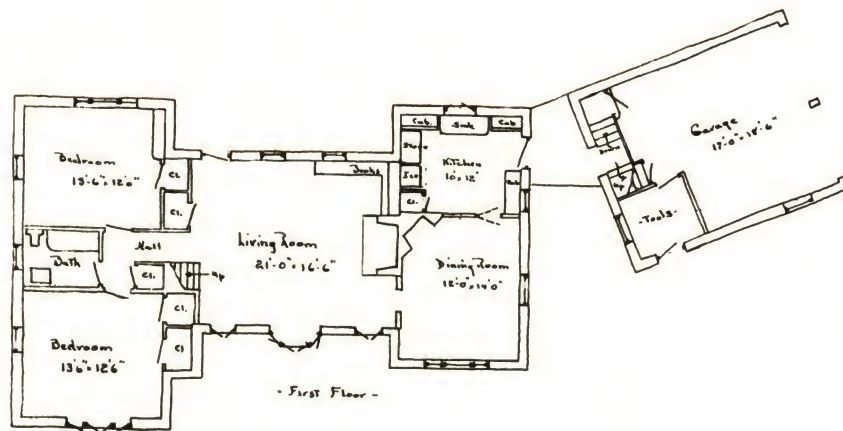


- First Floor -

Designed by  
*Thompson*



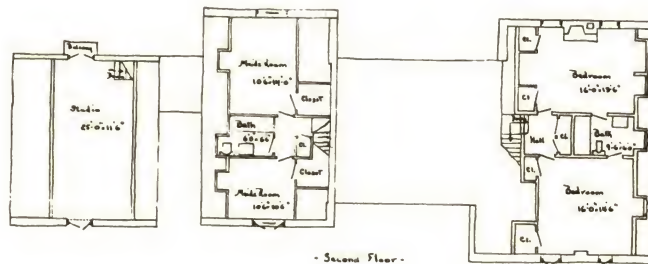




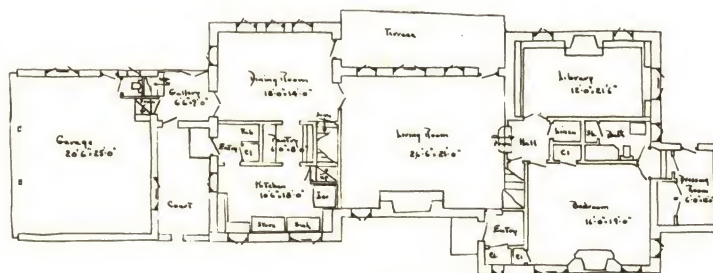




- Plan 207 -



- Second Floor -



- First Floor -

Designed by  
*Frederic J. Schmitt*



## CHAPTER 27.

### PLANS 206 AND 207:

Some time back I said there were only a very few original house plans. Thousands upon thousands of variations of each but all leading directly to a very few basic plans.

Lewis Mumford in "Sticks and Stones" says the printing press ruined American Architecture. Often I am accused of wholesaling plans because I distribute floor plans and renderings of every house I design, thick and heavy thruout the countryside.

But I have yet to repeat a house. Plans, yes. I have repeated one plan seventeen times but each time it was redesigned and each time it took a new personality.

Your wife and mine go to Lord and Taylor's to pick a hat. They may each select the same hat. But each pokes it here and there, cocks it this way or that till six hours later each hat has taken the personality of the owner. They are no longer the same hat. The same plan but different hats.

I mention this here because to be of any value a book of plans must be used only as a guide in finding what will do. Then, with that to start with, your Architect or Engineer can work your personality into your choice till it no longer resembles the original any more than Plan 206 is like its ancestor 114 or Plan 207 like its parent 68.

C H A P T E R   28.

PLAN 204:

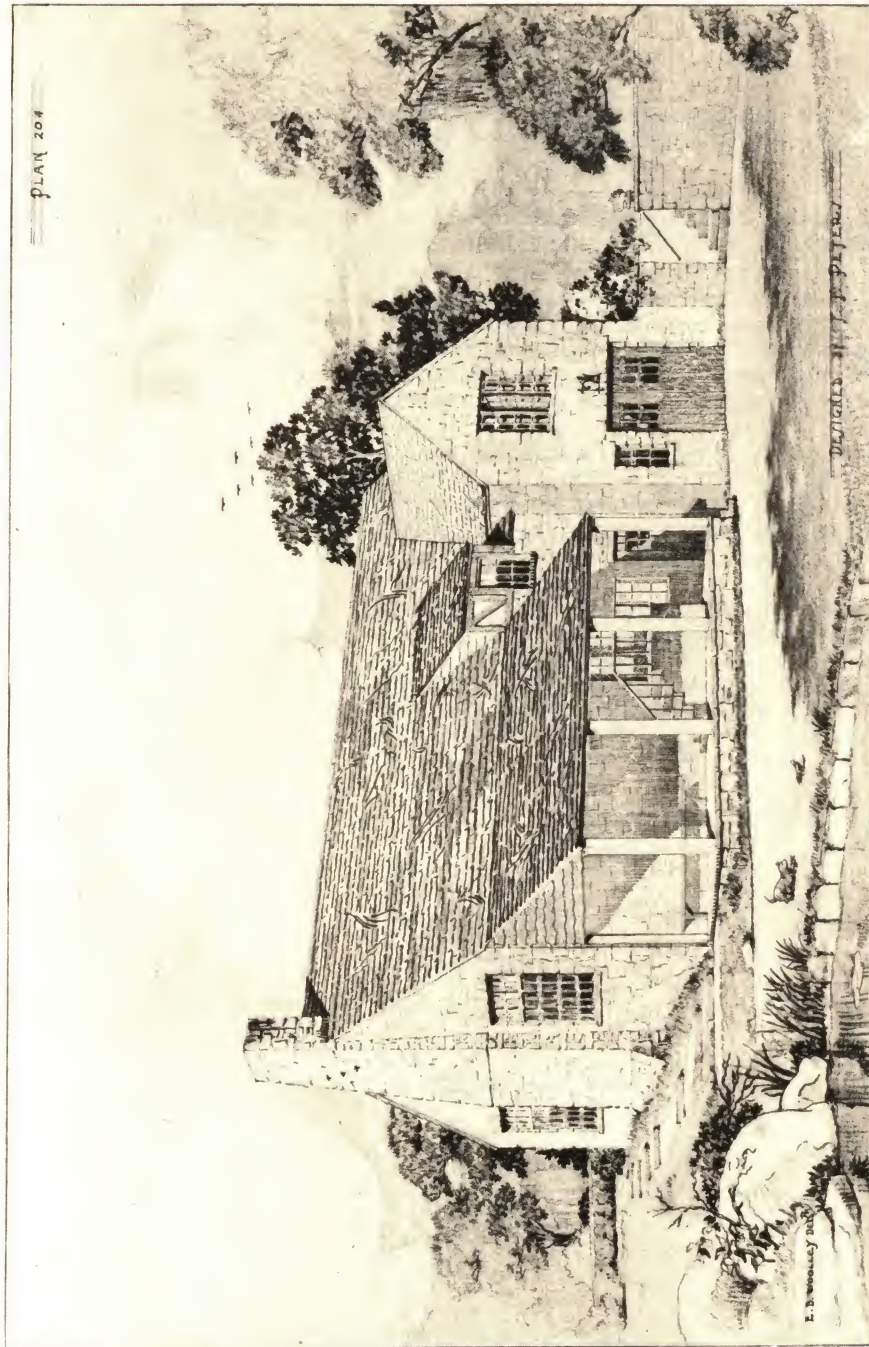
The past four years have taught us all the value of security. How long we will remember this lesson I don't know.

I believe, though, for at least a year after the Titanic - boat drills were held regularly on our Merchant Marine and inspectors were strict in inspecting life saving equipment.

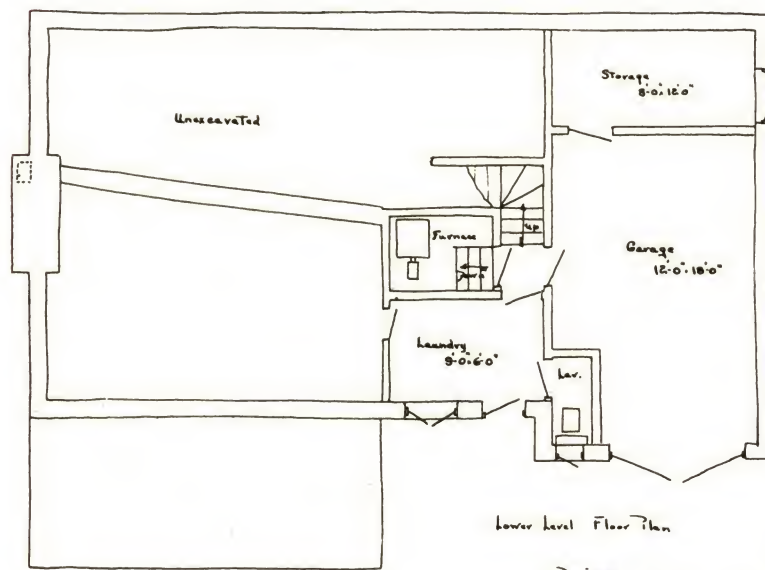
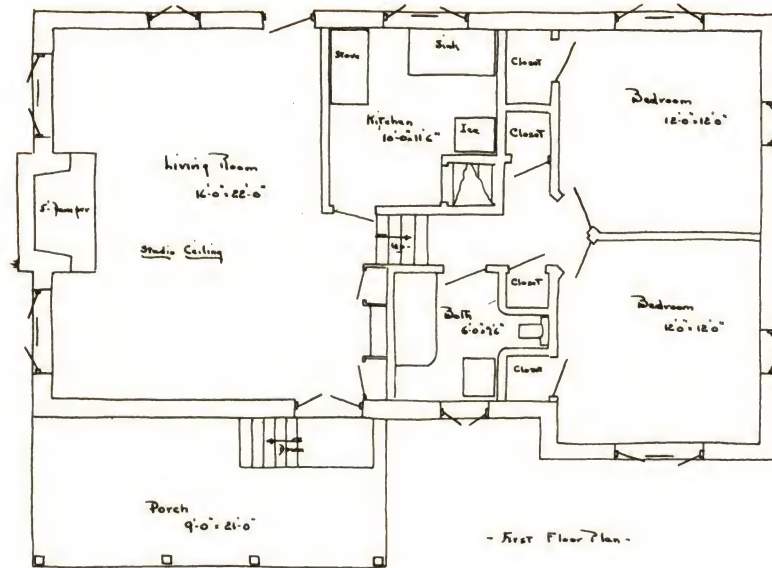
So now, at least for awhile, the few who are able to build have clearly in mind the desire to own a home - to own a home without the long string of first and second mortgages so characteristic of 1929 - to own a home that brings with it comfort, peace and security - not just worry and bluff.

Here we have such a house, built for a couple in Darien. In construction and appointments, it is extravagant in that it is built for permanence and low up-keep; in design it is simple and attractive; but in size it is calculated for two, two who wish security no matter what comes nor how long it stays.





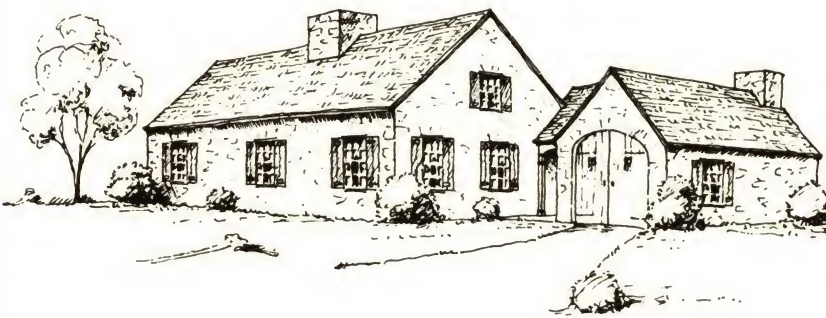
- Plan 204 -



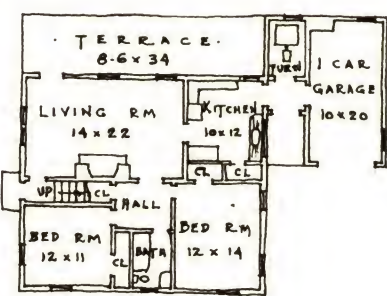
Designed by  
*Frederic J. Torrey, Architect*  
 Westport, Conn.



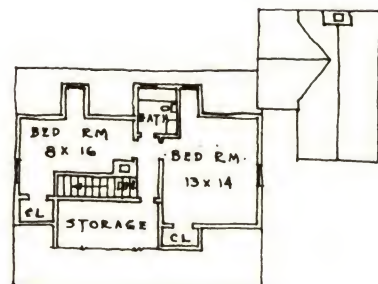
Plan 122-A.



PERSPECTIVE.



FIRST FLOOR PLAN.



SECOND FLOOR PLAN.

Travis Tammann Plans.

Plan 122-A.

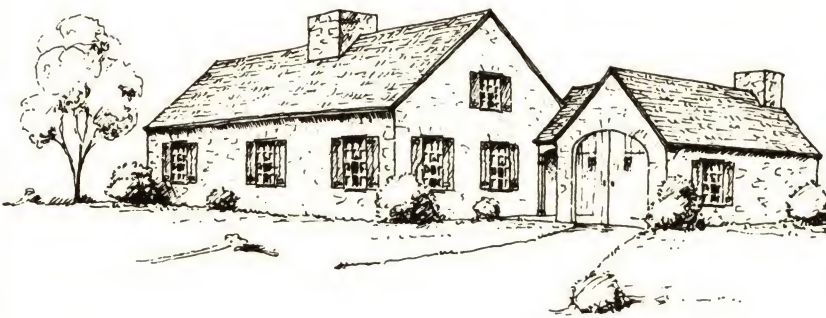
PERSPECTIVE.

FIRST FLOOR PLAN.

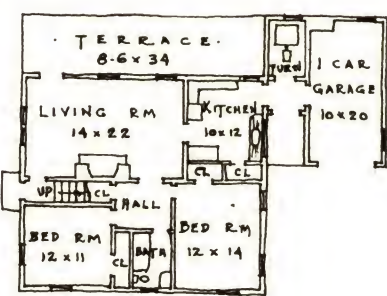
SECOND FLOOR PLAN.

Travis Tammann Plans.

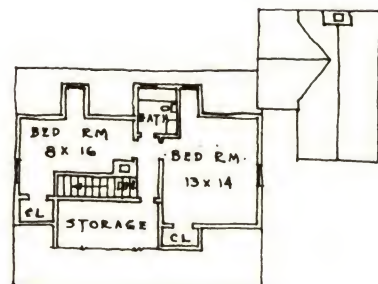
Plan 122-A.



PERSPECTIVE.



FIRST FLOOR PLAN.



SECOND FLOOR PLAN.

Travis Tammann Plans.

Plan 122-A.

PERSPECTIVE.

FIRST FLOOR PLAN.

SECOND FLOOR PLAN.

Travis Tammann Plans.

Plan 122-A.

PERSPECTIVE.

FIRST FLOOR PLAN.

SECOND FLOOR PLAN.

Travis Tammann Plans.

\*\*\* P A R T    I I I .    \*\*\*



## C H A P T E R   29.

We are all more or less familiar with stone masonry walls, especially those of us from in and around New England.

The first stone houses were probably built with walls resembling piles of stone, more than walls as we know them today.

Gradually, the drudgery of handling so much material forced man to develop a method of laying one stone upon another in a more systematic way, which gave a thinner, more economical wall which, at the same time, was as strong, if not stronger, than those used by his forefathers.

The stones in these first walls rested one upon another, and the strength of the finished product depended upon the firmness of their "seat" on each other, how well they were interlaced, and the thickness of the wall itself.

With the discovery of natural cement came the development of the wet wall (so-called) and, with it, still thinner and higher walls.

A wet wall was at first not very different from a dry wall, except that the stones on the outside and inside faces were laid up in a natural cement or lime mortar. This mortar had little strength, and was only slightly more permanent than the moss or mud it replaced. Slowly, the cements used were improved and made more available, till the wet wall, as known today, was evolved.

The wet wall was a great improvement over the dry wall, and had greater strength and better weathering qualities than the latter, but was by no means perfect.

As proof of this fact, there is an Italian saying "Build yourself a house of stone. The first year let your enemies live in it. The second year let your relations use it. The third year move into it yourself."

During the first two years, the enemies and relations are expected to find the leaks and plug them up.

In the first place, stones have just as definite a grain as wood, and this grain usually runs lengthwise of the stone, so that when the stones are laid horizontally, as they must be in a handlaid wall, the grain is running into the building. This means that water is led into the wall through the natural splits and seams of the grain by capillary attraction.

Water is also drawn into the wall through the natural capillary crack between the stones and mortar.

This moisture accumulates in the center of the wall and

can leave by either of two directions. Namely, to the outside or inside face of the wall. Which course it will take is problematical, unless there is a heavy wind which gives it no alternative than to flow through.

If the stones were completely enveloped in waterproof cement mortar, the moisture could not get beyond the stone through which it entered. But excessive use of such expensive mortar is out of the question. Large voids are not permissible, but still the wall cannot be made absolutely solid mortar and stone. Consequently, a part, at least, of this water finds its way through voids, cracks, etc., to the interior of the building itself, and only a part runs back outside.

Experiments recently conducted by a large research bureau on means of waterproofing masonry walls revealed the rather startling fact that shabbily built walls actually leaked less than the most carefully laid ones.

The explanation was that the poorly laid walls had more holes for water to run in by, still, they also offered less resistance to its flowing out the face, a less circuitous and shorter escape than to the interior.

Having resigned ourselves, then, to the fact that stone masonry is bound to leak, the problem is one either of making it easier for the water to flow back outside by furnishing convenient holes, or of making it more difficult, or even impossible, for it to penetrate to the interior face.

Masons specializing in handlaid walls often accomplish the latter by applying a 1" waterproof coat of cement mortar to the inside surface of the wall. This serves as a dam on the interior of the wall, and water penetrating to it builds up till it eventually flows back outside. This, however, is an expensive procedure, besides to my mind being an evasion of the issue.

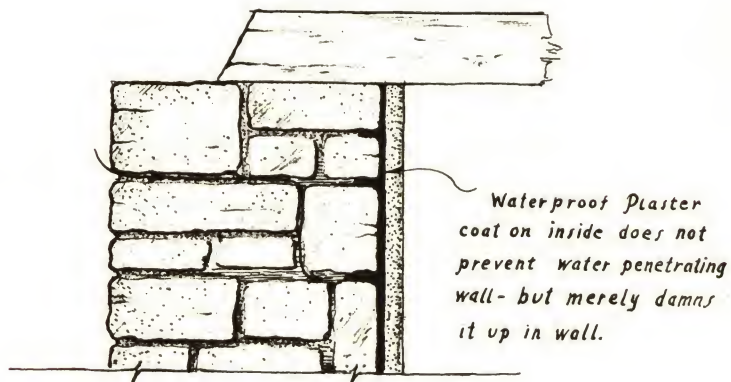
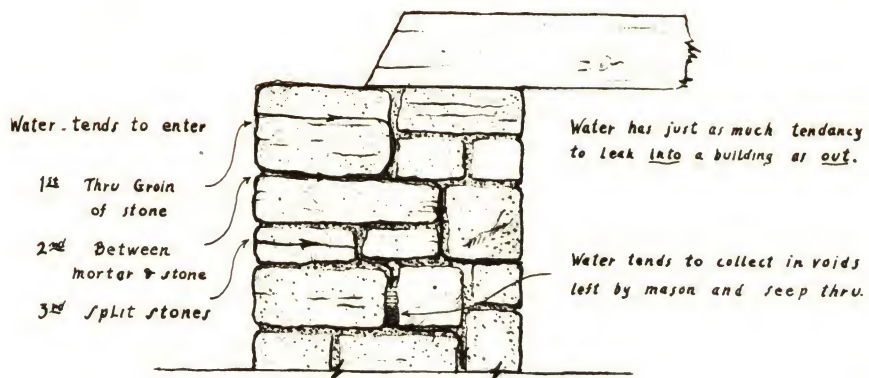
The veneer wall was then developed. On Page 118 I show a section of a veneer wall with its waterproof coating between the masonry and the wood frame. This tar paper coating functions perfectly, and any water penetrating to it is stopped and either flows out through the stone, or down between the masonry and this paper.

Veneer, therefore, is perfect so far as water tightness is concerned, but as I have explained, misses on every other point.

Returning again to the handlaid masonry wall, I wish to make it perfectly clear that it can be made tight, but only at an excessive cost.

The dam for my own swimming pool is a handlaid wall and, incidentally, is made of badly shattered and porous stone. But still it is absolutely tight.





# WET STONE WALL

## Characteristics



So you see that it can be done, and be done without a waterproof plaster coat on either side. The answer is mortar with plenty of cement.

My stones are laid in a rich putty-like mortar, taking about 12 bags of cement to a yard of sand. Every stone is completely encased in this mortar. No stone directly touches another by at least an inch.

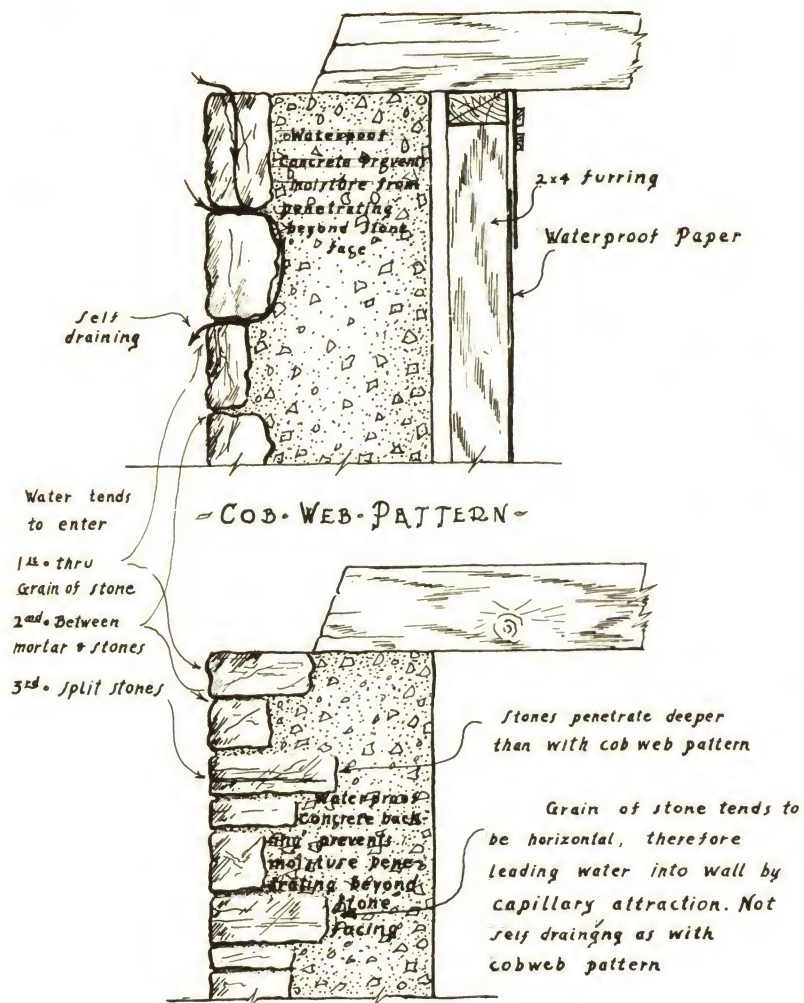
The stones in this wall, therefore, are nothing more or less than pure ornamentation. In theory, they bear the same relation to the wall that the stones in my usual Flagg type wall do, the only difference being that expensive mortar mixed with large stones was used to back the face, rather than concrete.

If it had not been a very small dam, I could not have afforded this type of construction, and if it had not been very irregular in shape, I would not have wanted to.

On Page 117 I show two types of Flagg walls. The first the so-called Cob Web pattern, in which the stones are laid on end, and below the handlaid pattern, preferred by many architects.

Comparing these sections with the walls I have already discussed, you will see that the waterproof concrete backing (which also holds the stones) in a Flagg Wall is the equivalent of the interior waterproof plaster coat of the handlaid masonry wall, and the wood frame of the veneer wall. It prevents the penetration of moisture beyond the outside layer of stones, and it serves to carry the building loads.

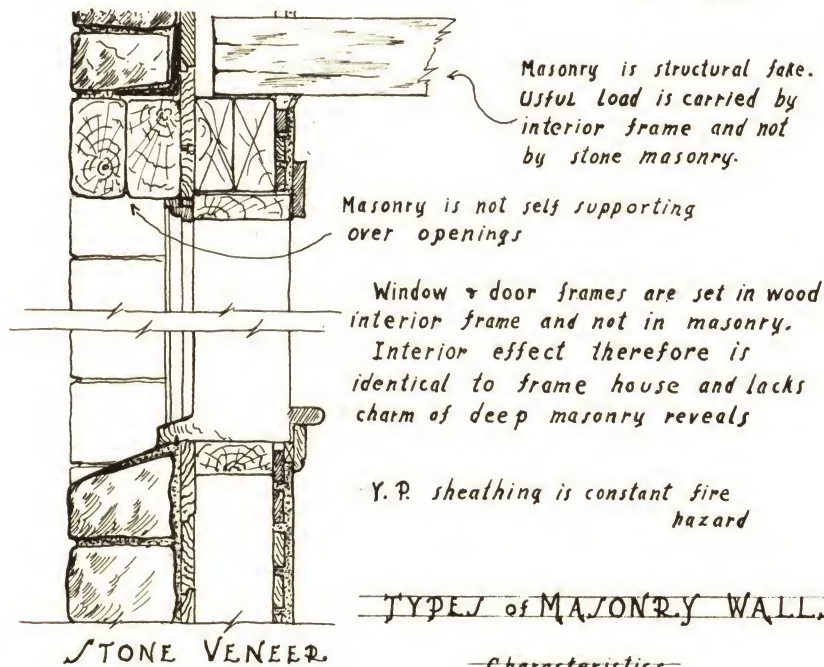
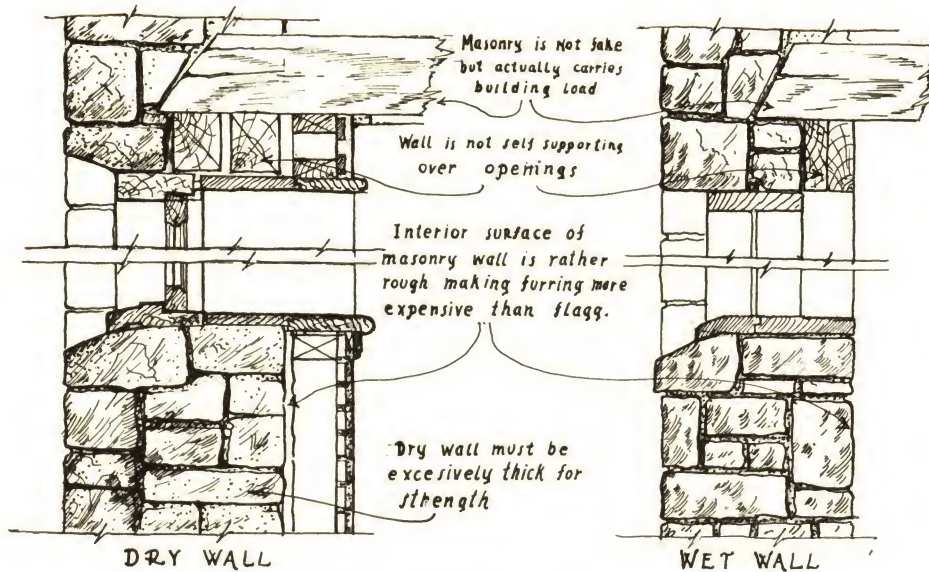
In the Cob Web pattern, the stones and the seams between the mortar and stone are self draining and moisture penetrating the stones only gets 4 or 5 inches inside the wall. With the handlaid pattern, the stones penetrate more deeply, and the seams and grain being more horizontal, make it more difficult for it to escape. But in both we have the same impenetrable mass of concrete, not only protecting the interior from moisture, but preventing it from penetrating the wall as deeply as it does in either the handlaid or veneer types.



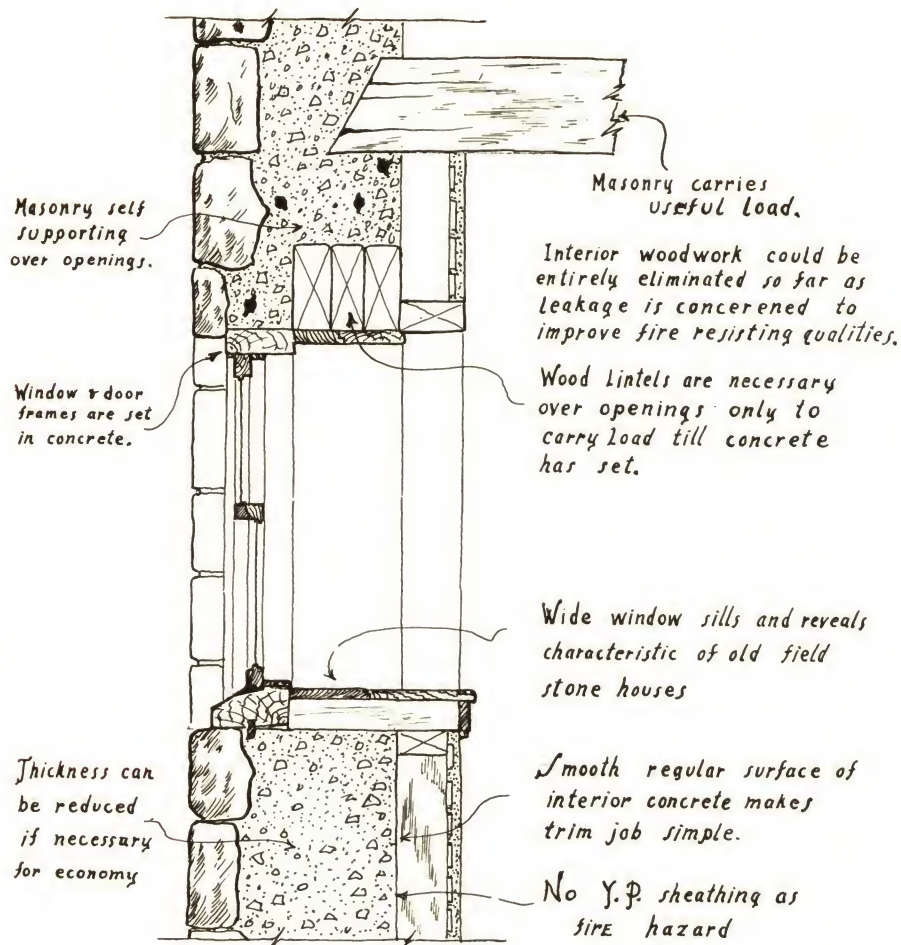
### HAND- LAID- PATTERN

### ~ FLAGG- MASONRY- WALLS ~

Characteristic







# STRUCTURAL CHARACTERISTICS of FLAGG MASONRY WALL

## CHAPTER 30.

### DETAILS OF FLAGG CONSTRUCTION

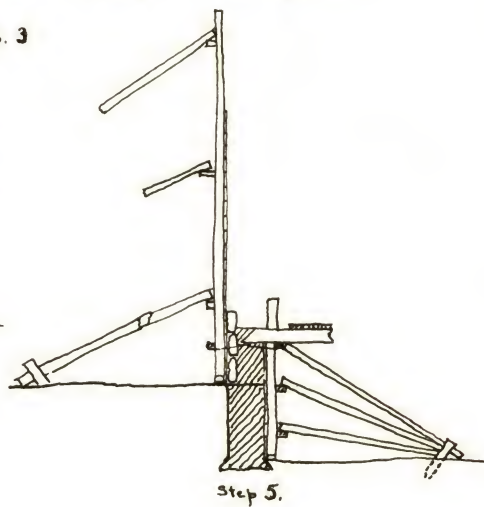
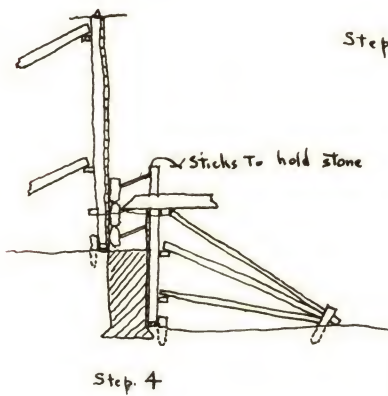
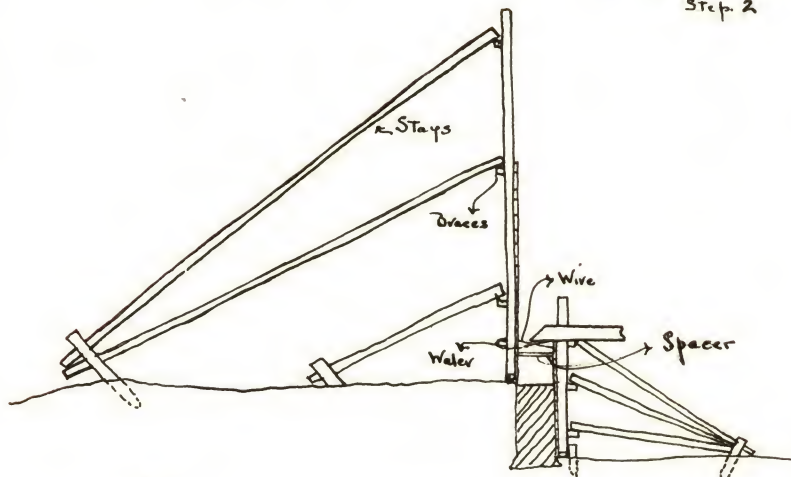
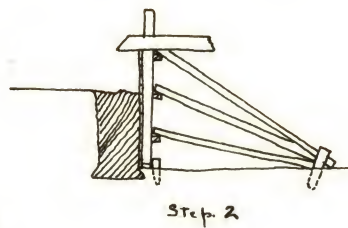
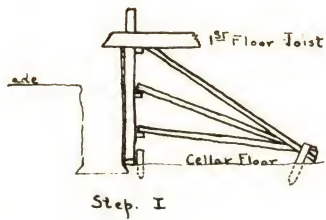
This long thesis has been written around a process so simple that I think ten words should be enough to describe it.

In fact, it is so simple that any contractor familiar with concrete construction should be able to go out now, with what I have already said, and start work. I have nothing startlingly new to offer, either in my methods or in the Flagg process. But after building one hundred houses I naturally have developed a routine and certain short cuts which have made for success with me. Others will improve on them and evolve new routines of course, but this at least will give us a basis from which to start discussion.

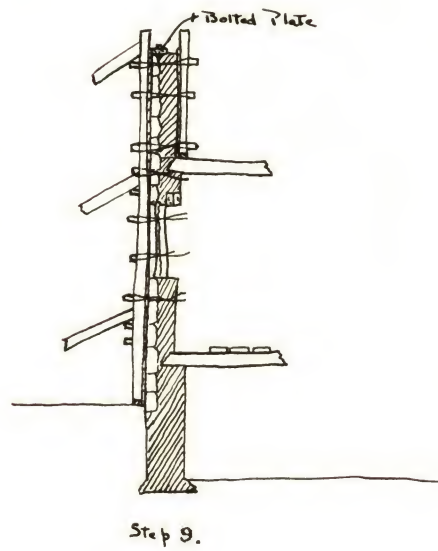
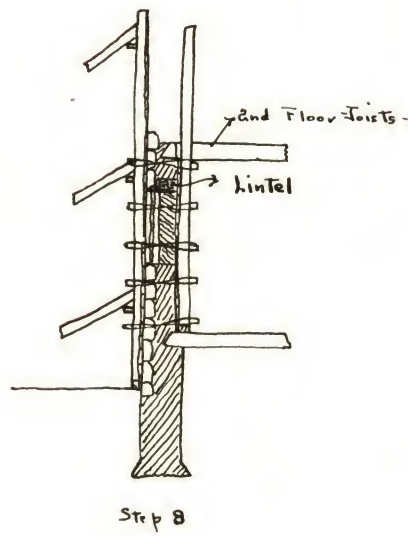
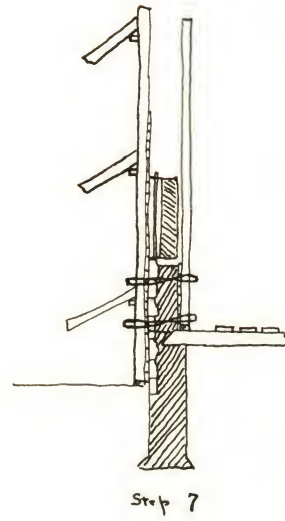
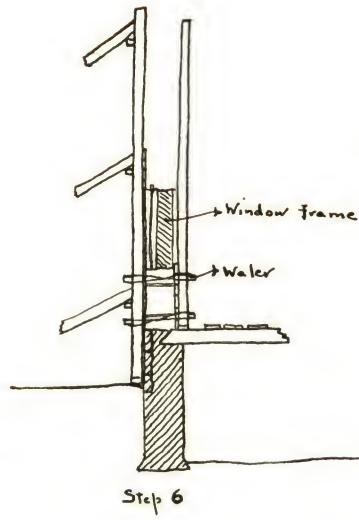
#### PROPOSED ROUTINE FOR FLAGG MASONRY CONSTRUCTION FROM CELLAR TO PLATE

\*  
-----

- Step 1. Carpenters build inside forms and footing forms to bottom 1st Floor Joists. (Where double forms are necessary, carpenters build outside forms to grade.)  
Carpenters set 1st Floor Joists on forms.
- Step 2. Laborers pour cellar wall and footings to grade.
- Step 3. Carpenters build outside form to plate and sheath to convenient height.  
Carpenters wire outside and inside forms.
- Step 4. Masons lay stones against outside form and hold them in place with sticks.
- Step 5. Laborers pour to top of joists and remove sticks and spacers.
- Step 6. Carpenters remove cellar and footing inside forms. Carpenters place and set all 1st Floor Window and Door Frames.  
Carpenters build inside forms to 2' height and wire to outside forms.
- Step 7. Mason lays stone and laborers pour to top of 2' forms.
- Step 8. And so by successive 2' steps to bottom of 2nd Floor Joists.
- Step 9. Carpenters set 2nd Floor Joists and erect inside forms and masons and laborers lay stone and pour concrete







respectively in 2' steps till the plate is reached.

Carpenters set plate with bolts imbedded in concrete.  
Mason lays to it and laborers float concrete under it.

Step 10. (Not illustrated)

Laborers remove outside forms.

Laborers chip excess cement from surfaces of stones.

Mason points around window and door frames and between stones.



Success or failure, so far as costs are concerned, is entirely dependent upon:

- (a) Economical forms.
- (b) Efficient organization of the job on the site.

Success or failure, as far as durability of the structure is concerned, depends upon:

- (a) Good concrete.
- (b) Good forms.





(c) Protection of window and door frames against head leakage.

(d) Selection of stone and proper pointing.

When I first started building these houses some ten years ago, the whole looked very complicated to me and I was a mental wreck as a result of the continual worry about costs and troubles after the buildings were up.

Looking back now, I wonder why it all came so hard. Gradually I find I have worked away from all the revolutionary ideas introduced by Mr. Flagg and others, and have adopted with only slight variations the same methods employed by concrete men throughout the world.

But, after all, that is the very essence of what I am trying to impress upon you, namely, that there has been a lot of mystery built up around this method which is uncalled for.

For instance, in the matter of forms, I have reverted from special wood forms designed by Mr. Flagg to ordinary temporary 2 x 4 and sheathing forms such as any general contractor uses in pouring a simple cellar.

The only variation to this is the combination of wood forms for the outside with steel (sectional) inside, which is merely a combination of two standard practices, and involves nothing new.

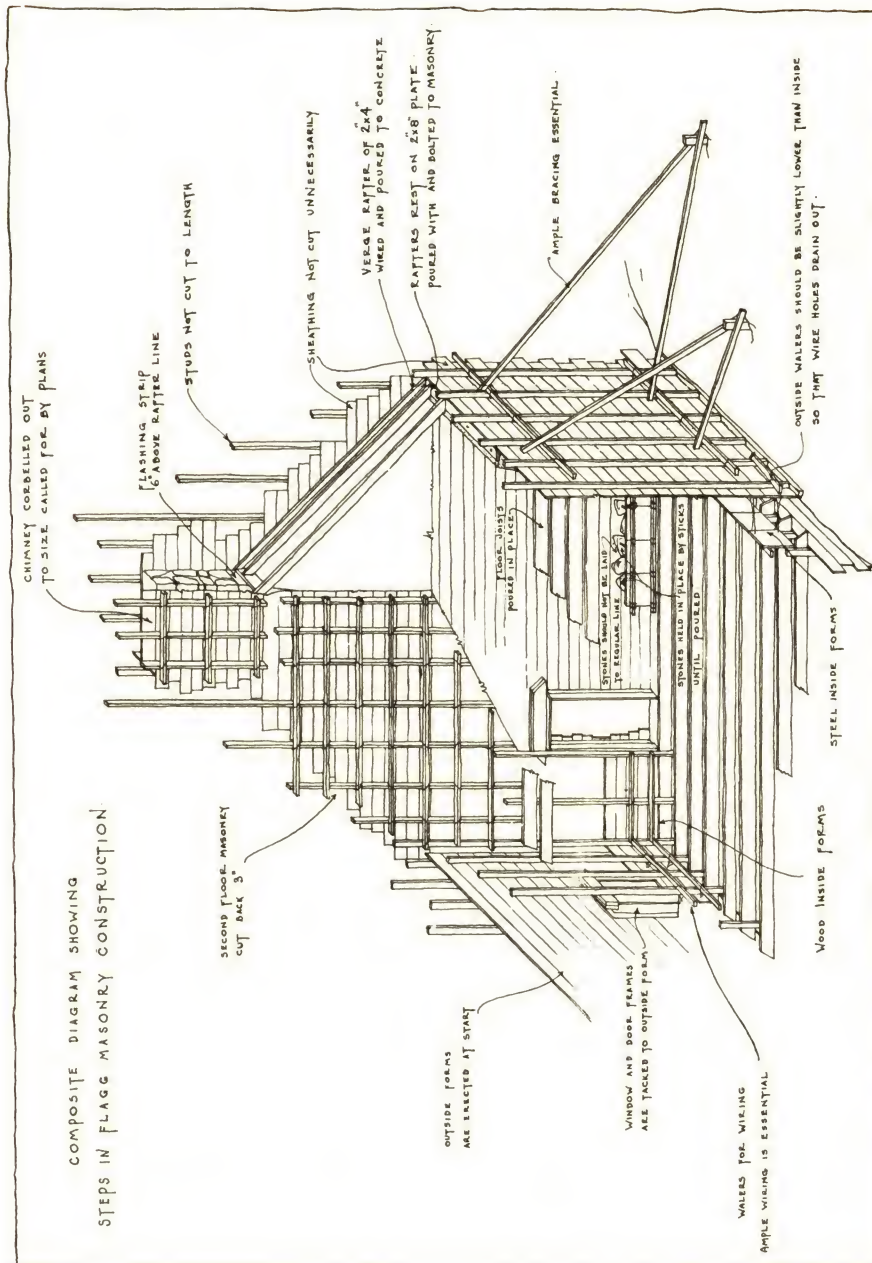
Sectional wood forms are not satisfactory, because they are too substantially built to permit of reclaiming the lumber without excessive labor costs, and, on the other hand, are not rigid enough to withstand the hard wear and tear to which they are subjected.

A set of wood sectional forms for an average house costs about six hundred dollars, and will serve ten houses, with careful handling. A set of sectional steel forms costing \$1,200, however, has already done fifty houses for me, which gives a cost for steel of \$24 per house as against \$60 for sectional wood.

Therefore, when it comes to sectional forms, steel is preferable. But though I prefer steel on the inside, where the forms must be erected 2 feet at a time, I have found it cheaper to use wood for the outside.

The reason is, first, wood can be erected more cheaply than steel in large sections, and, secondly, though the loss from cutting is fairly high on the inside forms, the loss on the outside is less than the depreciation of steel.

But whenever wood is used for forms, it must be used up in the building or counted as a dead loss. One erection and one





pouring does not damage lumber to such an extent that the 2 x 4's are not plenty good enough for studding and the sheathing for roof boards or rough flooring. A section erection, though, literally makes junk of it, so that it becomes a complete loss.

But, though I prefer this combination of wood outside and steel inside, I have not found any material difference in cost when I have had to use wood throughout. Therefore, contractors doing only one or two houses, need not feel the use of steel essential to success. The difference lies mainly in the greater convenience of steel and fresher lumber in the finished building.

Wherever wood is used for forms, the carpenters must be coached in the intelligent use of nails. The forms should be strong and rigid enough to resist the strains to which they are subjected, but there is no point in building them to withstand hurricanes and cyclones.

The ideal form, from my point of view, is one which, when all its braces, stays and walers are in place, stands plumb and rigid, but when the stays are removed and the wires out, practically crumbles into a spineless pile of lumber.

Carpenters are used to applying sheathing to the side walls of a frame house with 2 10 $\phi$  nails to each board. This is quite proper, since they are working on a permanent structure which must be tight and free from warping. But in form work, the function of the nail is merely to hold the sheathing in place till the concrete is poured. Any tendency to curl or drop after that is successfully handled by the pressure from the concrete. Therefore, I use nails no heavier than 6- $\phi$  for applying sheathing and but one of them to a stud.

There is no need of citing more than this one instance, because the contractor will have to use his own judgment in this matter, bearing in mind that form strength should come mostly from the stays and ample wiring of the two forms together.

The next source of loss in form building is the shrinkage by cutting. The clean-up on my first houses used to yield one or two truck loads of short 2 x 4's and sheathing, too long for fire wood but still too short for building.

I had about decided to start the manufacture of matches as a by-product when I discovered that vertical studs need not be cut to any special length, that stakes could be driven to take standard lengths of lumber, and that sheathing could sometimes be run by a corner to avoid cutting. The forms might not look as neat as forms with studs exactly level at the top and with stakes neatly set in a row, but it made a much neater looking purse at the end.

The next item in form economy is labor. Forms should be well built, of course, but not unnecessarily so. A forms carpenter



must learn to look at his work much as a pattern maker does. The only part of the job that counts is that which affects the concrete. Braces, stays, walers, and sheathing can be as irregular as you wish on the outside, so long as they present a smooth rigid surface on the inside.

In wood form erection, I follow exactly the same procedure a carpenter would in erecting the side of a frame house. I first put down a 2 x 4 shoe, next tack and temporarily stay my verticals (spaced 2' instead of 16") and commence sheathing. The form is then lined, plumbed and permanently stayed.

Carpenters used to form work can set forms by this method more quickly than steel and once done, it leaves all hands to concentrate on the inside when the job has started.

Success or failure, so far as economy, depends on these points, the same points, incidentally, upon which the success of any concrete job depends.

No mention has been made of the cost of laying the stone or pointing or any other item peculiar to this process. The cost of laying the stone and pointing is about 1/10th the cost of the other masonry work. Inefficiency on these points is not desirable, but perfection on them will not mean success unless the job is run efficiently from a purely concrete point of view.

The real novelty in the houses which I am building and urging others to build is not in the Flagg process, but in the fact that this process opens up an entirely new class of masonry buildings to concrete contractors. Heretofore they have usually concentrated on cellar work or fairly large industrial jobs. Concrete houses of the class illustrated by me were fairly rare.

The small house offers all the intricacies of a \$50,000 industrial job focused upon a \$2,000 gross contract, and success or failure is dependent upon being able to organize it as efficiently as a large one, and not upon the technique of pointing or laying stones.

A big job goes along with the slow, long stride of a cross country hiker. A small house job must steam like the hundred yard sprinter. Neither less efficient than the other, but both built along materially different lines.

My usual crew on a small house is composed of:

- 4 or 5 carpenters (includes the foreman)
- 1 Mason
- 4 Laborers

However, as the job proceeds the number can be increased two or three fold with economy, if the job is properly organized.

My organization takes over the job as soon as the excavation is complete. The carpenters are first given the job to themselves to build the cellar forms, set the first floor joists and generally get the job organized.

The carpenters are then laid off and the laborers set to pouring the cellar and footings to grade.

The laborers are then laid off and the carpenters return to set the outside forms and all the first floor window and door frames. While this form work is going on, a mason and helper build the fireplaces preparatory to setting forms around them.

When this preparatory work is complete, the real job of pouring the side walls commences. The whole crew is set to work.

Stone is brought to the mason, who at once starts laying it and the first stone should hardly be in place before the laborers start to crowd him with concrete.

One mason should be able to keep ahead of four or five laborers with no difficulty. Every stone picked up should be placed. Before him he has twenty or thirty feet of wall. A place can be found for any stone, and he must be trained to lay every stone he picks up. Give him more time and he will produce no better job, but succeed in looking just as busy.

As soon as the mason has laid a section to the top of the joists, the crew must be pushed by the carpenters, who start at once to erect inside forms, thus urging them to wheel more and more "mud."

This ring-around-the-rosy should be kept up to the bitter end. The mason continually clamoring for more forms in which to lay stone, the laborers pushing the mason ahead with their concrete, and the carpenters constantly closing in their work with new gaping forms and laying runways or building scaffolding to open new fields of adventure for them.

Once started, the interest must be kept going. The job must not be permitted to get cold by stopping. If, for some reason, it is out of balance, the lagging crew must be increased or the others decreased.

Novices at the game often stop pouring to let the carpenters get way ahead on their forms. This is a mistake. Men work best when they are in competition. Preparations for large pourings are a mistake - large pourings themselves are all that count.

Keep the mixers going always full speed ahead, and add enough men to absorb their output. Put your best laborer on the mixer and let him try to kill the laborers. What he puts in has got to come out, and you will find that you can pretty much control your job by watching him.







And speaking of mixers. Don't put too big a unit on a small job. Mixers that take too long to load and mix mean laborers waiting around for a batch. Two small mixers are far more efficient than one large one, and, incidentally, can be handled by one man, whereas a large mixer usually calls for two. Concrete should go up in a strong steady flow and not in surges, which is usually the case when big mixers are used.

And while this is going on, the foreman, of course, must be anticipating the runways, scaffolding and picking up every moment of spare time of any crew or any individual to tear down forms, haul in stone, set floor joists, or the dozen other incidental jobs that keep cropping up.

Salesmen will constantly be urging labor saving machinery upon you, as they do upon me. The obstacle, though, is always first cost and time of erection. Jobs costing but \$2,000 gross for masonry and taking but four or five days to pour cannot stand the cost of a day or two in erection nor fourteen hundred dollars invested in machinery which will only show a saving of fifty or sixty dollars.

In most of my dealings there is very little second floor masonry, but when it does become large, as, for instance, Plan 29, I set up a simple Sasgen Wheel Barrow derrick on the 2nd floor joists, which is able to handle both concrete and stone, and costs but three hundred dollars complete.

I personally feel that eventually some more efficient method of elevating concrete will be found for the small job. It has not yet. And I also believe that you will find that the eventual machine will take the form of some kind of pump which will deliver a steady, constant flow to the forms, and until I am offered such a machine I shall continue to use my wheelbarrow and laborers' backs.

So far as the success of the job structurally is concerned, the special points to heed are -

- (a) Good concrete.
- (b) Good form work.
- (c) Protection against leaks.
- (d) Selection of stone and proper pointing.

The first point is covered in the publications of the Portland Cement Association, and each and all of their recommendations should be followed.

Contractors having trouble with leaky concrete usually resort to one of the many so-called waterproofing compounds, expecting the compound to make up the deficiencies of their mix. Incidentally, they do get good or better results, but not due to the waterproofing compound - simply because they followed the directions of the waterproofing company which specified in addition





to the compound a proper mix of cement, gravel and water and methods of pouring which, in themselves, give waterproof concrete.

The best waterproofing compound on the market is Portland Cement. Compounds tend to make it flow more easily, but otherwise, except in rare instances, are dependent on the cement itself for their so-called waterproofing properties.

Use a dense, fairly dry concrete and spade it thoroughly --- use a good hard clean sand and gravel --- use good fresh Portland Cement of a standard brand, and you need have no fear of masonry leaks from porous concrete.

Bulging and irregular walls indicate poor form building and not only affect the general appearance of the job, but increase costs all along the line when it comes to trimming the inside.

We have already spoken of adequate bracing, and the only other point besides that and general neatness is wiring.

Use plenty of wires. Set walers every two feet in length and wire every four feet along their length. The mason undoubtedly will complain once in a while that these wires interfere with his laying stone, and often he will cut them. He must not be permitted to do this and must fit his stones in and around them.

The wires should be drawn tightly against spacers so there is no slack, and at least a No. 10 iron wire should be used, so that there is no stretch.

I personally have not bought any wire for about three years, having located a Telephone Company dump from which I reclaim their discarded galvanized line wire. I find it excellent, and recommend my readers to investigate this source of supply before spending their good money.

Despite any statements by experts to the contrary, all stone masonry is subject to leaks, and a characteristic of hand-laid stone houses is stained plaster above and below windows of the first floor.

Recently the report of a research committee at one of our leading institutes had to be suppressed because its findings were so hopeless.

I, too, had my troubles at first, but gradually, by following the simplest rules of concrete design and construction, have overcome them.

Concrete and stone are both porous materials, and all surfaces of either material must be pitched to shed water, just as our competitors, the carpenters, use wood, an even more porous material.





The chief causes of leaks I have found (barring roof)  
are:

- 1st - Around the window sills, showing up in rooms below  
either at joist line or at lower frame heads.
- 2nd - Chimneys at flashings or around tile joints.
- 3rd - Split stones.
- 4th - Improper pointing.
- 5th - Acid washing.
- 6th - Joints between pourings.

Every building, whether frame or masonry, is likely to show one or two leaks, after the first storm or two, which are caused by split shingles or other causes, and even Flagg houses are not the exception to this rule.

If possible, the inside work should be delayed till the roof and sash are in place and the building has weathered one or two storms. Any spots showing a tendency to leak can then be definitely located and stopped right then. Rain, however, is not easily controlled, and many houses are completed before their baptismal storm comes. In that case, it is sometimes difficult to trace the source of the leak, because the water may run down between the plaster and the masonry wall a long way before it encounters an obstruction which deflects it onto the plaster.

The chief cause of leaks I have found, though, is in the pointing of the window sills. Masons tend to carry the pointing above the lower outside edge of the sill, which actually develops into a rain catcher, as the sill dries out and shrinks. They would not do this if they would simply follow the rule which I have already set up, namely, all surfaces must be made to shed to the outside.

In the illustration of the sill you will note the strip mortised into the frame. Similar strips, either mortised into the frame as this is, or in the form of a casing, as illustrated for double hung frames, should always be provided on all window and door frames to prevent a crack as the woodwork dries out. (This is even more important for the sides and head than for the sill, and should be carefully followed.)

Chimneys are another cause of leaks, either because of faulty flashing or slanting flues. Flashing strips should be inserted in the forms six inches above the rafter line, as shown on Page 126 to form a recess to take the flashing when the roof is laid and counter flashings placed.







I have found the simplest procedure is to use a 1 x 2 furring strip having a piece of wood lath lightly nailed to its upper face for this strip.

This strip is placed in the form at the proper point by the carpenters. The tinner removes the lath when he comes to it, but leaves the furring strip in place. This gives a straight edge to work against and just enough room to slip his flashing in above it.

After the flashing is in place it should be carefully pointed with plastic cement and not Portland Cement, as copper has a large coefficient of expansion and would soon crack a hard mortar.

Where chimneys are corbelled out over the roof, especial care should be taken to use a dense concrete and to see that the pointing is absolutely tight, since any water getting into the concrete is bound to come right through into the house.

The chimney top offers another source of leaks, and should be carefully pointed and slightly arched to shed the water which would otherwise form puddles.

The only other source of trouble with chimneys leaking is slanting flues. This sometimes is unavoidable, but architects should avoid this whenever possible, because unless flues are capped, a great deal of water flows through them during heavy storms, and it is almost impossible with slanting flues to avoid some leakage through to the plaster.

Split stones do not often cause leaks, because even though the stones do leak, the concrete backing usually prevents it from getting clear through. Nevertheless, shattered or cracked stone should not be used, and when it is, the splits or cracks should be laid to drain. When split stones are causing leaks, they should be given a paraffin spray to fill the cracks.

I have continually spoken of the waterproofing effects of the pointing. As a matter of fact, a Flagg masonry house is much tighter before pointing than an improperly pointed one.

The reason for this is simple enough. All the masonry joints in the unpointed house are the result of concrete draining downwards and outwards. This is exactly the course we wish rain water to follow, and it naturally does.

All pointing should be done with this same principle in mind. Cement should never overlap the upper stone, but should undercut it.

Where flush pointing is wanted, this effect need not be exaggerated, but the principle should be adhered to.

The general idea is to produce a pointing which has a shingle effect so far as the general relation of stone to mortar is concerned.

So far all my pointing has been done in the old fashioned way, with a mason using the old fashioned trowel. I should prefer using a cement gun and hope some day to own one, because unless particularly warned, a mason does not get deeply enough into the seams between the stones and objects to applying the elbow grease necessary for a really dense job.

This point should be watched carefully, as otherwise voids are left between the pointing and the concrete in which water may collect and cause trouble.

In the rush of other work the pointing is sometimes left till the last thing. This is not good, because a better joint can be made between the pointing mortar when the concrete is fresh, so architects and contractors should both insist that the pointing be started immediately after the forms are removed and pushed to a conclusion.

Some four years ago, just when I thought I had everything all settled so far as leaks were concerned, three houses I had built on a local development started it in about fifty different places. I was at a loss to account for it, because during construction they had been absolutely tight. Then suddenly I realized it had been caused by an acid wash which the owners had given them, and later experiments proved this to be the case.

The stones are a little smeared at first, though very little, if a proper mix is used. This smear wears off after just a few months and has not bothered most of my clients.

Where owners object to this condition for even such a short time, the contractor will have to give the building a scrub with steel brushes, rather than an acid wash, because the acid breaks the joint between the pointing and the stones, thus nullifying any good effects expected from the pointing.

And finally, the most dangerous of all leaks is that caused by improper joining of pourings. There is no excuse for this, because the contractor knows perfectly well that where old surfaces show erosion, they should be chipped to good solid concrete before any new material is placed.

This again brings out the main point of this whole essay. Success depends not on new and mysterious principles, but merely upon those already established and advocated by the Portland Cement Association. Good concrete will make a good job and poor concrete naturally a mediocre one.



## CHAPTER 31.

Starting from scratch with the rough concrete wall and before the house is even roofed, the question is how to finish her.

The first problem is the roof, both as to outside covering and its relation to the rooms below.

The side walls being of a permanent material, it is only natural for the owner to wish to make the roof equally permanent.

The matter of first cost may be the determining factor when ready cash is scarce but where considerations of cost are not so important, the matter of insurance and durability should settle it.

So far as insurance is concerned a stone house with a combustible roof is rated as a frame house and takes the highest dwelling rate. A stone house with a non-combustible roof, though, is classed as semi-fireproof and is insurable at about one-half the rate of a frame house. Therefore, though the first cost of a slate roof may be \$500.00 or \$600.00 more than wood shingles, still the annual saving in insurance may be \$70.00 gross, or a return of about 11% on the money invested.

As far as lasting qualities are concerned, I think for most of us both slate and wood are beyond our natural span of ownership, though of course slate will last just as long as the roof timbering itself, while wood only about fifteen years. Assuming slate lasts a useful period in your life of thirty years and costs about as much again as wood and you have justified the investment by the complete return of the principal fifteen years from now when one re-roofing is avoided.

Slate is not the only non-combustible material, nor does that simple word define even that class of material.

First I will dispose of the manufactured roofs by saying some are frightful and some, better. But say what you will, all are imitations of the real thing. Today, at least, genuine slate is cheaper than these copies so why bother. Someday these roofing manufacturers will give up copying and then we may have a different story. But in any case, let's hold to genuine materials. The sides of the building are genuine - the roof must also be genuine - slate if possible - wood if not, but never those spotted calf-like things which dot our modern developments.

When it comes to slate, we find a note of artificiality has crept in too. Years ago no slate was used unless it came from a solid, clear-colored vein at least thirty feet underground. The slate was cut and split into regular shapes and applied in a regular fashion to the roofs.

Today in Vermont we find the slate manufacturers have started a new vogue. A vogue of freaks. Slate around cracks where water has settled and given the rock a discolored mottled effect, is preferred. Slates of various colors are blended into a roof in accordance with certain formulas and maps prepared by the roofer and finally is cut into irregular sizes and thicknesses to give a so-called "thatch effect" to the roof.

These combinations run into money. They look no more like thatch than I do. Thatch is a soft pliable material, slate hard and unbending. Nevertheless I will admit, properly applied and properly blended they look well on certain types of houses.

Of course even though I admit the fact that these roofs look well, still that statement was qualified as to type of house. They have no place on our more austere Colonials. A variegated slate roof on a building of their height and particular type of dignity would be comparable with Queen Victoria or President Hoover in an Artist's Tam. No, these roofs are adapted to the smaller, cozy cottages since they reflect the ingenuity of the owner in utilizing a material resembling nothing more than a pile of junk.

When irregular roofs are out, either because of the type of building or the cost, and still slate is wanted, I prefer using either weathering green or a common variety of black of standard thickness. The black is the cheapest though most lasting and the weathering green a compromise, with its natural variations as it ages and takes color, with the riots of color perpetrated under the name of artistickness.

But to those who cannot afford slate of any kind but must stick to wood shingles let me say that their life is well over fifteen years, that they are more cheaply and easily repaired than slate and finally are cooler to live under.

Where changes and additions to the roof are contemplated in the near future, slate will be found quite a deterrent so far as expense is concerned, whereas wood offers no special obstacles.

The actual roofing material having been settled upon the matter of framing must be decided.

In discussing various of the plans, I have spoken of the pine ceiling which I used above the living room of Plan 114 or in the second floor bedrooms of 122, or in fact any.

This type of ceiling was developed by me both as a means of economizing and as a decorative effect.

It is more economical than plaster because the plaster lath and ceiling joists are replaced by a layer of #2 White Pine and Cabot's Quilt and it is decorative because we have learned to associate barn timbers with the more glamorous life of our artist friends.







Just how much is saved depends upon the particular job in question. In a large studio living room such as Plan 129A where the owner wished the pine omitted but had rafters exposed with plaster between, the saving is relatively large as a result of avoiding scaffolding and awkward working. In Plan 122 the saving is not so much in actual labor and materials as in time. The cost of a small job particularly is definitely tied up with its simplicity of fabrication and though the material may register on both as about the same, still the contractor can shave more closely when short cuts like this are used.

Grown people may not care to have bedrooms with vaulted ceilings and exposed timbers but before discarding the idea for the children's rooms, remember that their room is not just a room to sleep in but a place in which they live as well. Trapezes, banners, pictures and what not can be stuck around on such a ceiling at will and the room given a most cheerful tone whereas the more conventional type is apt to be always just a bedroom.

Very often the wife wishes the kitchen thrown off the usual drab sanitary type and where it is in a separate wing making this type of roof possible, we have found it produced the effect desired. (See Page 149.)

The timbers are usually 6x6 on two foot centers which means almost the same number of board feet as standard 2x8 rafters on sixteen inch centers. No ridge board is used but the timbers butted against each other for the sake of appearances, though it does mean more careful cutting by the carpenter.

Square edge, random width (8, 10 and 12") Pine is laid directly over these timbers, care being taken to make it tight and to mix the widths.

I specify square edge because the Pine is bound to dry out as the house ages, causing a crack to show between the boards. If tongued and grooved material is used this will show as an unstained streak of fresh lumber, whereas with square edges only a dark shadow results.

Next the insulating blanket of Cabot's Quilt is laid, especial care being made to lap it well at the joints.

There are many materials which can be substituted for Cabot's Quilt from various insulating wall boards to Balsam Wool blankets. The wall boards are not as good insulators, due to their compactness and the wool blankets too loose for a good roofing job.

Cabot's Quilt consists of two layers of paper with a layer of sea weed between, held in a compact, homogeneous layer by heavy stitchings which give it the appearance of a quilt.



When slate is used the roof is solid sheathed with 1x10 Ship Lap or 1x6 sheathing if you prefer. When wood shingles are specified, the roof should be stripped with 1x4 roof lath, spaced in standard fashion to prevent rotting of the shingles. In either case, care must be taken to get good nailing on every timber and joints never broken between timbers.

Finally with slate #15 slater felt is laid over the sheathing and the slate applied. With a wood roof, the shingles are applied directly to the roof lath in the usual fashion.

From the first, my experience with these roofs so far as insulating qualities were concerned has been most satisfactory, but not until recently did I understand the technical reasons for its great efficiency as an insulator.

Most people have been taught that an air space beneath a roof is absolutely necessary and that no other means of insulating is as efficient. This is correct providing the air is dead air, i.e. without motion. In the space between the roof and the plaster there is motion of the air, from the cold to the hotter surfaces. This motion defeats the object of the air space to such an extent that this combination of two layers of Pine with Cabot's Quilt between has been found superior to the more conventional finish.

Of course the #2 Pine and Fir timbers specified by me can be changed to Oak or Chestnut or when an exceedingly rough effect is desired, Pecky Cypress. #2 Pine has been adopted as standard by me merely because it is the most economical material for the purpose that is at the same time attractive.

Where the Pine ceiling is not desired, standard practice is followed and whatever roofing is selected is applied in the usual manner.

The roof completed, I invariably have the eaves of all sections of the house Sprayo-Flaked as well as the underside of the roof when common rafters are used and budget permits.

Sprayo-Flake is a mixture of a tar and water glass binder with chopped up paper and cloth. It is applied by spraying in varying thicknesses, depending on the problem. It hardens after a day or two and though we at first expected to have considerable difficulty with its dropping off, experience has shown it remarkably permanent.

Many materials are advertised for roof insulation but I believe this type of material far superior to anything in sheets or rolls for this particular use and have yet to find a material so well adapted for use along the eaves.

The building is now to be prepared for plaster on the inside.

I have tried various methods of plastering. First without air space, direct on the masonry. Secondly without air space but over Sprayo-Flake. Thirdly with a 1" air space and finally with a 2" or 4" air space.

The first method is unsatisfactory, (i.e. applying the plaster direct to the masonry) and I have dropped the practice entirely. The reasons why it is not satisfactory are:

- First: The lack of air space means lack of proper insulation.
- Second: The plaster being applied direct to the masonry over a tar plaster bond is bound to show even the smallest pinhole leak.
- Third: The joint between the plaster on the wood partitions and the masonry walls is bound to crack.
- Fourth: An air space is extremely useful in concealing pipes and electric conduits.
- Fifth: Application of trim is difficult.

The second method of applying the plaster over a coating of Sprayo-Flake is theoretically satisfactory but I have only used it once and am not prepared to answer regarding its permanency till it has been on at least another year.

The 1" air space is the method used by me till last fall when the stimulus of the depression inspired us to increase the value given by shifting to a 2" or 4" space.

When the one inch space was used the mason set furring strips on the inside face of the concrete for nailers. The carpenters then merely had to tack vertical 1x2 to these nailers for lath nailers.

The real objection to this practice was that it tended to give a very uneven finish to the interior because the furring being light, conformed too much to the unavoidable irregularities in the concrete which resulted in too irregular an interior.

Of course the interior furrings could be shimmed out to a straight line but the saving over using a heavy material does not warrant this additional labor.

In addition to the improved interior the one inch air space caused complications and drilling to conceal pipes or install base plugs.

The larger air space of 2" to 4" is made by using 2x4's without nailers in the concrete. They are laid flatways for the 2" space and edgewise for the 4". The increase in material cost is about one cent per outside square foot and the increase in labor negligible when weighed against the simplification of wiring.



Prior to lathing a layer of waterproof paper is applied to the furring lapped to protect the plaster from any moisture forming in the air space and running down the paper.

The plaster base is applied directly over this paper no matter what type is used.

Personally I prefer to use Celotex Lath as plaster base for all the side walls. It not only is a most superior base on which to plaster, but is also an insulator against heat and cold and a sound deadener.

Either wood or metal lath are cheaper but are not comparable to it, to my mind, for side wall use.

I do not recommend it for ceilings though, because it sometimes stretches and buckles with the weight of the plaster when wet.

Celotex Lath is the same material which used to be made only in large sheets, but now is also made in sheets measuring 2'x4' with interlocking edges and is now called "Celotex Lath." Many other wall board manufacturers have a similarly sized product, and they may be just as good, but I have standardized on Celotex for two reasons.

First: Its thickness is best adapted to my method of trim and secondly, being made of Shredded Sorghum and rolled at one time, it is fairly homogeneous and consequently less liable to loosen with age as wall boards made up of several layers do.

Of course all corners should be reinforced with metal lath, preferably galvanized.

Where a room is to be finished with a white coat in preparation for paper, corner beads should be used. But where the plaster finish is to be rough and the walls painted, I object to the stiffness and regularity of the beads and omit them entirely.

The mason, under my system is instructed to make his corners as true and straight as possible without this artificial aid. The desire is not to be slovenly, nor to save money, but to obtain naturally the uneven line which harmonizes with the rough plaster effect.

The treatment of the windows is the next most important detail of these houses. This is not dictated by Flagg Masonry but by economy and tradition carried down to these houses from those built centuries ago.

The most interesting feature of their interiors is the wide plastered reveals on each side of the windows with the deep tile or pine window sill.

Whether casements of steel or wood or double hung frames are used, I follow the same procedure. For sides and head there is no trim but the plaster is carried to the frame itself and as little of that exposed as possible.

The only interior trim, therefore, to windows or doors in my houses is the sill, and here either a  $1\frac{1}{4}$ " wood sill can be set in above the concrete or a colored Faience tile used.

The tile is slightly more expensive but this extra cost can be more than offset by the benefits both practically and artistically. Tile is colorful and lasting. Wood may be necessary where a room is panelled but it bruises so easily and is so permanently affected by wet flower pots, etc., that I would avoid its use where possible.

Many people advise the use of Inside Opening Wood Casements and I agree that from an artistic point they are preferable and are the only type I would or have used in my own personal houses.

The advantages of this type window are that the screen is on the outside and the sash opening in is not damaged by the wind. But though this window is satisfactory in France, somehow it does not take so well to our American climate and usually leaks badly.

So far as this climate is concerned the best type window is the guillotine or double hung type. Where the spirit of the design is Colonial, this is the style window which should be used, but when the architecture is more modern or foreign, outside opening wood or steel sash should be specified.

Where double hung sash are specified the standard box frame should be used with a light  $1 \times 3$  outside casing to key it into the concrete.

Where wood casements are used I use a heavy frame as per detail shown in Fig. Page 119 in preference to the conventional  $1\frac{1}{4}$ " casement frames handled by most dealers. The heavier frame permits of a better bond with the concrete and is less liable to sag under the pressure to which it is subjected while pouring.

When steel sash are used I invariably set them in wood bucks which are set in the forms prior to pouring. I have poured my steel sash direct without the buck, but find it rather expensive to build forms around, besides not leaving sufficient room for a proper bond with the cement and still allow for plaster. The wood buck not only serves to make a tighter job but also makes screening more convenient.

Many will want to know which sash is preferable, wood or steel. The arguments are about equal and builders differ but they run something like this - steel are cheaper - wood are better look-





ing - steel are windy - wood shrinks and swells - wood can be weatherstripped - steel cannot - steel rusts - wood rots. Decide for yourself, they are even.

Exterior door frames are constructed and set in the same way. They are set before any concrete is poured and are done with once and for all. That is the key to true economy in building. Try to make every job the end of that.

In building door frames particularly, care must be taken to use heavy material as otherwise they are likely to warp and bulge from the weight and moisture.

The only other novelty in the trim of my buildings is the method of applying the base and door frames.

A base to me is not an ornament but merely a means of protecting the plaster from damage by brooms or toes. The base in my houses is a simple 1x4 piece of white pine applied before plastering. This means that in the finished room the base is flush with the plaster and does not act as a dust catcher as an ordinary base with its ornate moulding does.

Heavy trim to my mind is out of place in the small house. In talking to builders operating in New York I am always amused to hear them remark on the necessity of wide, full trim in the Bronx if a building is to be a success, whereas on Park Avenue the reverse is the case.

For my door frames I use a simple molded trim manufactured by standard trim dealers or just simple 1-5/8" half round. A narrow trim of this kind requires a tight plaster job and to insure this and a proper joint with the base, I set my jambs also before plastering.

When this is done and my house plastered I have the floors to lay, the doors and sash to hang and quarter round to place, a matter of just a few days.

Arched doors lend a certain ecclesiastical air to a house which to many is most attractive. Some time ago I had occasion to do a job in which every door was arched and yet narrow 1 1/2" trim desired. This was impossible with the usual built up frame and scrolled trim because if it were to have any strength the frame would have to be at least two inches thick and the trim 4" wide.

Furthermore, with a built up cut out frame the joints of the different sections would show and the inside of the frame would not be one continuous grain.

After some haggling, The Bridgeport Wood Bending Company, whose trade to that time had been limited to carriage work, agreed to make them for me and they proved not only cheaper than the



usual frame, but far more satisfactory.

In this work we found Birch was the only satisfactory material, Pine tended to wrinkle and Chestnut or Oak to peel. The complete frame with half round trim and stop, cost about \$10.00 an opening, which in quantities could be cut considerably.

The frame itself was  $7/8$ " clear Birch stock, the trim made by first bending round stock and then splitting it into halves and the stop by bending stock Birch door stop.

Of course the door itself is quite an item in arched openings and though I do not ordinarily approve of plank batten doors, still in each case where we have used arched openings we have also used a batten door rather than go to the expense of special and expensive panelled doors. The effect of the heavy plank door with its arched frame and narrow trim is quite startling and echoes the feeling of masonry whereas the more conventional type with its wide trim has always seemed in poor taste to me because arched openings are not a logical product of the carpenters' trade but are a relatively simple type of opening for a mason to build.



## C H A P T E R    32.

In the East during the last ten years there has been a tendency, especially among the younger people, to go "Greenwich Village" in the interiors of their homes.

I have no objection to this because it tends to make a less formal building of the home, excepting when it becomes artificial and results in poor construction.

Two items in particular that they demand have caused architects and builders no end of trouble, namely, wide flooring and batten doors.

Many old houses have batten doors. Many old houses have wide Pine or Oak floors. But the batten doors in those old houses were merely a temporary expedient and as the owners became wealthier and the panel door cheaper, they were quickly replaced. The flooring remained wide but their houses were not drying kilns six months of the year and normal the other six.

Wood, as you know, swells and shrinks across its grain. In the batten door every board therefore is swelling and shrinking across the width of the opening. Each one is pushing its neighbor till on the whole width the effect is about two and one half times (for a 2'6" opening) as much as in the panel door in which the two outside pieces, each only six inches wide, are the only parts which swell and shrink in the width.

Theoretically, I could leave a space between the boards to take up this shrinkage and I do that in two or three ply outside doors, but for the lighter, one ply, interior doors this is not possible and still have any privacy.

Clients always blame modern lumber, claiming it is not seasoned well enough, on the assumption that the difficulty is only one of shrinkage. As a matter of fact, though, we have as much trouble with doors swelling in summer as we do with shrinkage in winter. Our lumber is just as much too dry today as it is too wet. Our houses run from a humidity of 10 or 20% in winter to 100% in summer and just as long as this condition exists and we build of wood, we are going to have slack doors half the year and sticking doors the other half.

Floors are the same. Time and time again I have remarked on the marvelous wearing qualities of the old Oak plank floors of the old houses around me, only to see them open up cracks large enough to take the leg of a chair when modern heat was installed. Or again I have seen kiln dried seasoned material of the same kind laid in a modern house either open up in winter or buckle and heave in the summer.

Narrow, flat grain, Oak dries just as badly as the wide



flat grain Oak, and across a wide room it may amount to five or six inches. But with narrow flooring it is divided into four to six times as many smaller cracks.

When our homes have complete air conditioning outfits, maybe we can return to wide flooring and batten doors, but until that time it is better practice to stick to panel doors and narrow flooring.

Discard, if you will, machine products designed to decorate, but accept those which improve the structure.

The matter of paint and plaster comes next, but I am going to let it go by.

Whether the house is to be finished in white or rough plaster or the woodwork painted or stained, is a personal detail for the owner to decide.

Cost enters of course, but no matter what he does now, if he has built his structure in accordance with my other suggestions, his house will be good. I should like him to spend extra money for steel joists and concrete floors. That would make it perfect. But even without those, stone walls, a slate roof, double Oak floors over heavy joists, with clear White Pine trim and doors, his house is better than the best frame already. Let him continue to decorate as he will and can, I am primarily interested in the base.



## C H A P T E R    33.

If you have followed a series of articles which appeared in one of our great national weeklies about the Flagg process the first thing you want to know is whether Flagg houses actually cost less than frame houses.

To this I must answer "I don't know" because I have never built a Flagg house.

A Flagg house as described in these articles is a cellar-less house, having inside opening casements, a special partition and roof, a few other trick items of hardware, and finally is built of stone in accordance with the method I have described.

The public was well aware that none of these features excepting the partition, the roof (neither practicable nor attractive features) and the masonry were new and therefore could not be claimed as economies and quite naturally decided that in some mysterious way his method of laying stone effected most of the saving.

Now as a matter of fact, the cement, sand, and gravel used to form a square foot of surface in a Flagg Wall costs as much as a frame wall and when the labor in building the forms, etc. is added it leaves frame three times cheaper per square foot.

There is no need of saying anything further in this connection except to add again, "I don't know what a Flagg house costs but I do know what houses of Flagg Masonry cost and can tell contractors how to estimate them."

Estimating the cost of Flagg Masonry is simple enough and contractors familiar with concrete construction will find it costs about 1.1 times as much as green concrete i.e. concrete unpainted or burnished.

For those not familiar with concrete, wide figures should be used until they have worked up some of their own.

For instance for walls to eight feet high, allow \$14.50 for the finished wall. \$17.50 from eight to fifteen feet and \$20.00 per cubic yard for points higher.

These figures are safe enough because my costs from about ninety houses built in the last six years show that even the worst never exceeded \$17.50 whereas they often averaged as low as \$14.00.

All that is simple enough but what about this owner who wanted a cheaper house even than frame. Well Flagg Masonry houses are not for him, they are rather for the man who wants something better than frame, in fact the best known type of side wall, and if sacrifices have to be made, is willing to make them.



I can do business with that man because though a Flagg Masonry house does cost more than the same house in frame, still it need not cost any more than the frame house he had expected to build.

Every animal develops a protective instinct against his natural enemy and so designers of stone houses and those who really crave them, as I have already pointed out, have developed what is almost a protective instinct in designing stone houses to compete with frame.

Laymen not familiar with these factors in design still think there is a catch somewhere and fail to realize that on any stone house a saving can be made by building in frame, but if the house has been well designed, the saving will be small.

As an illustration of what I mean I am putting at the end of this paragraph the costs on three plans taken from the books of The Fairfield Builders Inc., Fairfield, Connecticut, and which were selected by me to illustrate this point.

Plan 106 is a small six room Flagg Masonry house built in Fairfield, Connecticut, for a young couple who could afford to pay no more for this house than their neighbors had paid for their frame or stucco houses. We labored on the problem for many months and now it is finally built.

This six room house with two tile baths, studio living room, hot water heat, full cellar, oak floors and its Flagg Masonry Walls cost \$6000.00, or just \$1000.00 per room.

This same house in frame would have cost \$274.00 less but, or rather since he had planned to spend \$6000.00, if he had not economized somewhere in this house it would have cost him \$6274.00 or just \$274.00 more than he wanted to spend.

What did we cut? Well we didn't cut wall thicknesses, we didn't cut insulation, or timber sizes or substitute cheaper grades of flooring. No, everything that went into that building was of the best. We cut in the only safe way. We didn't cut, we eliminated. We eliminated plaster on the ceilings, we omitted wall paper, we substituted thumb latches for brass locks and finally we had it within his price.

But supposing we had kept it the same and it had cost \$274.00 more than the same house in frame ( $4\frac{1}{2}\%$ ) would it be worth it? Build the two side by side. Would anyone believe the stone house cost only \$274.00 more than its frame neighbor? No, never.

Plan 77, however, presents another phase of the problem. Here we have a typical frame design built in stone whereas in 106 we had a pretty fair stone type with its low spread and side walls.

But even here where the cost of the side walls runs

three times as much as frame, we find it only affects the total cost by about 9%.

You see the cost of the outside shell is only about one-eighth the total cost of the building. Foundations, roof, plumbing and all those items remain the same for both. Double or triple the cost of the shell and your total cost is affected less than 10%.

Is it worth it? Unquestionably.

"Can I afford it?" I don't know, but certainly if you can afford the frame house but can't stand even 5% more, why then you can find some things you can eliminate and possibly eliminate to the betterment of the house.

Summary of Costs: Plan 106 - 20,000 cubic feet.

Built August 1932.

#### Masonry

##### Flagg Side Walls

Stone	-	15	-	37.50
Cement	-	100	-	60.00
Gravel	-	30	-	75.00
Carpenters	32 hrs.			48.00
Laborers	130 hrs.			130.00
Masons	219 hrs.			109.00
				<u>459.50</u>

Machinery and	
Forms	50.00
Insurance and	
Overhead	<u>106.00</u>

615.50 (Frame would cost)  
(\$274.00 less )

All Other Masonry and	
Plastering	634.50
Plumbing and Heating	1050.00
Rough and Finish Hardware	160.00
Linoleum	60.00
Tile (2 baths)	250.00
Carpentry	2190.00
Paint	269.00
Electrical	125.00
Overhead and Profit	<u>550.00</u>
	5904.00

Note: Cost of Flagg Masonry \$14.50 per cubic yard.



Summary of Cost: Plan 77 - 77,000 cubic feet.

Built August 1931.

This is a typical Colonial type and though many are built of stone, it is not a particularly suitable type. The actual costs are as follows:

Layout and Batterboards	40.00	
Clearing site	42.00	
Excavation, Blasting	640.00	
Flagg Masonry Side Walls	4106.00	(Frame would cost 2900.00 less)
All other Masonry	2776.00	
Miscellaneous Iron	146.00	
Reinforcing Iron	52.00	
Rough and Finish Hardware	378.00	
Slate Roof	840.00	
Carpentry	11805.00	
Sprayo-Flake	341.00	
Tile Baths	765.00	
Linoleum	170.00	
Plumbing and Heating	5480.00	
Electrical	760.00	
Painting and Decorating	834.00	
Lath and Plaster	1769.00	
Septic Tanks	322.00	
Clean Up	133.00	
Overhead and Insurance	3354.00	
	<u>TOTAL</u>	<u>\$34741.00</u>

Note: Cost of Flagg Masonry \$17.00 per cubic yard.

Summary of Cost: Plan 104 - 38,700 cubic feet.

Layout and Batterboards	25.00
Excavation, driveway, grading, dry-wells, waterline	480.00
Masonry and Porches	2570.00
Carpentry and Screens	4300.00
Linoleum	60.00
Tile Baths	300.00
Access Doors - rough and finish hardware	256.00
Sprayo-Flake	41.00
Medicine Cabinets	67.00
Miscellaneous Iron	230.00
Plumbing and Heating	2300.00
Painting and Decorating	675.00
Electrical Fixtures	310.00
Lath and Plaster	1280.00

Septic Tank	225.00
Areaway Grills	18.00
Clean up	52.00
Overhead and Insurance	<u>1500.00</u>
TOTAL	\$14789.00





## C H A P T E R    34.

How simple it would be for Transatlantic travelers if Customs House appraisers would use the same methods some mortgage or bank appraisers or even some Architects use in appraising buildings.

According to their methods the Customs House man would merely look at the outside of your trunk and say, "Oh, real leather case, let me see, the value of that at forty-two cents a cubic foot is \$56.00." Or to your neighbor, "That's a cardboard coating painted to look like leather, the value of that case and its contents is figured at the rate of thirty cents a cubic foot, or \$42.50."

There is just as much sense to appraising baggage in this way as houses and anyone who thinks a real idea of relative values can be obtained by any such simple process is an idiot. A house, just as much as your trunk, is composed of thousands of items which go to make up the cost and there is no way of finding what it is worth except totaling them up one by one.

I personally am not concerned with whether our Banks loan their money foolishly or not, or whether the public continues to buy on such a foolish basis, but I am concerned with the effect from an entirely different angle.

Everyone will admit that the most beautifully proportioned small houses were built before the days of Architects. They were built and designed by craftsmen interested in obtaining the most practicable building for the least money. They chiseled and cut here and there and got that very thing and, incidentally, got a thing of beauty besides.

Today our craftsman is gone and our designer sits before a drafting board in a Fifth Avenue Studio.

He draws a plan, cubes it and sends it out for estimates. The figures come in and he finds his rate is high or low per cubic foot. He may have vague ideas about the cost per square foot of utilizable space, he may have vague ideas about the cost of foundation or side walls, but he has no exact information on how or where he is off. Just the same he re-draws the plan and sends it out for figures again. Maybe he has it in balance and maybe he has missed, but at any rate his method of handling it is not intelligent, because he had depended on a sloppy, inaccurate method of analyzing the situation.

If we are going to take the matter of design from the job to the office, why then the office must do a really complete job. The office has got to really construct that house - not just design it on paper, but build it on paper. Every plank and every nail must be driven - every pound of stone put in place and every

dollar paid. Let our designers be builders - let them build on paper and then we will have beautifully logical houses again and the designers will not be smock wearing, long haired artists, but builders - builders with intelligence, knowledge, and imagination enough to build on paper what less intelligent minds must do in the flesh. Builders who may be labelled by the world as Architects or Engineers, but builders they are.

What I am getting at is that a rate cannot be set for any class of buildings. For instance Plan 106 cost about thirty cents a cubic foot to build, and 104, thirty-eight, yet 104 is the cheaper type.

Plan 104 cost \$2000.00 a room, and Plan 106, only \$1000.00, and still I say 104 is cheaper. Cheaper because each square foot of utilizable space cost only \$4.20, whereas in 106 a square foot cost \$4.80.

In Plan 106 a lot of cheaper cellar space helps out the cubic rate, but every inch in 104 is used so that though the cube rate is high, the cost of utilizable space is low.

Mortgage appraisers and most architects set up rates by classing their materials. They say for instance that frame costs thirty-two and stone thirty-eight. Yet Plan 114 cost only thirty cents in stone and Plan 77, forty in frame.

I am going to quite a length on this subject because I wish to make it clear that estimating is not as easily done as some would have you believe, and that the cost per cube is no criterion of value.

Houses, like anything else, have varying costs. A four square colonial in stone costs forty-four cents a cubic foot, while #114 only thirty. A Tuxedo costs \$120.00 and a sport suit with two pairs of trousers, \$75.00. Is either less of a buy or is either less desirable? It depends on what you want. Plan 104 cost thirty-eight cents a cubic foot and Plan 106 cost only thirty, yet 104 is cheaper on a basis of cost per utilizable space.

And that brings me back to where I started. Appraisers have led us to believe that frame houses cost one rate and stone another. To be sure frame houses are cheaper than stone as a class but frame houses vary from twenty-eight to forty-five or fifty cents a cube, depending upon the efficiency of the design and the mode in which it is finished. And stone houses vary likewise in a slightly higher but parallel zone, starting at thirty and ending at anywheres. The difference in these houses is not a difference in quality, but is due to efficient use of space and reduction of the trim. Of course if you are after an "all time low" frame is the answer, because the cheapest type of stone house can be built even cheaper in frame. But if you have in mind a slightly more expensive frame house, say costing thirty-four cents a cubic foot, you can have your house built of stone by either a



reduction in the amount of trim used or by careful utilization of space. The house may be simplified on the surface and the "guts" made stronger. The parts which can always be got at or added to will be fewer, but the shell which can never be changed will be stronger and worth while working on and adding to.



## CHAPTER 35.

To this point nothing has been said about the land on which we are to build. I have been treating houses as though they were built and assembled in one spot and just stuck down anywhere.

Unfortunately that sort of thing is happening too often. All around us people are buying plans from a newspaper or a magazine and just putting it down wherever and however it drops on the land. Plans can be taken from magazines and adapted to different lots but I have yet to find a single plan that will fit a lot without some changes.

Writers will tell you that there are only four original short story themes. I have told you and I repeat again that there are only just about that many original house plans. Each story theme has been written and rewritten around some new detail millions of times and so too each house plan has been designed and redesigned around some new situation, and any point which opens up a logical individuality for the plan should be welcomed by owner and designer in the same spirit that a writer grabs a new variation of one of the old themes. The lot offers the greatest opportunity and, in fact, the only visible chance of varying the old plans so that they are not hackneyed.

I have tried to show from time to time how the plans I have illustrated can be shifted around to fit various situations. Any one type will not fit every lot and no lot will take every type. Therefore before you can do anything you should first pick your land and with that in mind mould your house to it. In this way you are sure to obtain individuality and what would appear on the surface to be a new design even though it is just a simple rearrangement of a plan as old as carpenters' tools.

The lot is the foundation on which the whole is built. Select it carefully for individuality and value and plan your house to accent these points.

The selection of a lot is not an easy job. Some people have a real estate sense and others have not but I will try to list here things to look for and things to avoid.

In the first place, your whole investment must be gauged by not only what you would like but also what others would want. You may not figure on selling - your husband or wife may not - but still an emergency may arise where it is necessary to either borrow or sell so that resale value must be considered.

In considering resale value, however, do not try to straddle. Don't repress your own desires but merely avoid doing freakish things. Don't pick a lot out of your own class for economy or convenience but pick where you yourself would really want to live.



Next, always pick for individuality. Don't take lot No. 78 in the midst of several hundred like it. At least, if you must live in such a place, take the lot with the scrawny apple tree or the one slightly up or down but take something different from the others.

Very often you find odd shaped neglected pieces, irregular ones, with wet spots even, all maybe selling for less than the conventional ones around them. The wet spot might make a pool, the hill give us different levels, the tree a background for a garden. Pick for individuality.

In the suburbs of every city we find row upon row of houses built on 50x100 lots. They cost \$14,000.00 maybe and today they are worth \$10,000.00, though tomorrow they may again be worth \$14,000.00. Twenty years from now they still will be worth \$14,000.00 for private residences and will never increase much in value. Why? Because the house never appreciates and the land is in too small a piece to change value except in rare cases. Therefore if you wish your property to increase in value select a lot which has some size.

It is merely a matter of going a little further out to get an acre or two for the same price as a 50x100 lot in the center of things. Ten years from now your home will be surrounded by 50x100 lots each worth as much as your acre originally cost. If you don't care to sell you have privacy cheaply, but if you do need cash a profit is possible.

Most people in buying a lot worry too much about small details and overlook the more important ones. The locality being about right the selection of the individual lot should be made on three points. First: Individuality which I have already discussed. Second: Its appearance from the street, and Third: The outlook.

I don't think I need discuss the outlook because everyone looks for that anyway, but too many neglect entirely how the lot looks to others. I believe this so important myself that I have never walked on a piece of land till I owned it. I can take care of troubles within later but I can never change the effect of the immediate environs.

It is hard to describe what to look for but just bear in mind, don't buy a lot that you were not attracted to from the street. Worry as much as you please about water, levels, etc. after you have settled that point. Pick a lot only that you and others like to look at, not to throw a bluff but just because it's nice, and in real estate at least, worth money to have things attractive.

Now, how much should it cost? Roughly about one-fifth the cost of the house. A Twenty Thousand Dollar House on a Fifteen Hundred Dollar Lot is as bad as the same house on a Ten Thousand Dollar Lot. The investment should be in balance and experience has

taught me that this ratio of one-fifth is correct. Correct for the owner and most easily salable.

To sum up then all I have said is get as large a lot as possible, costing one-fifth the cost of the house you expect to build. Buy it in the area of town which seems most attractive to you and be sure to get something which has individuality especially as viewed from the street. Irregularities in grade can be used to advantage by the Architect and need not add to the cost of the house.





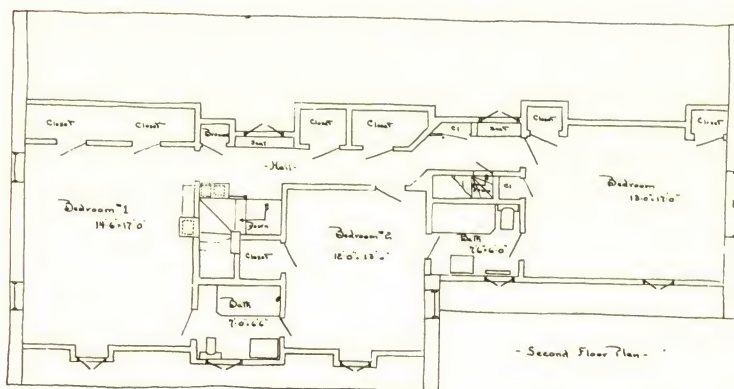
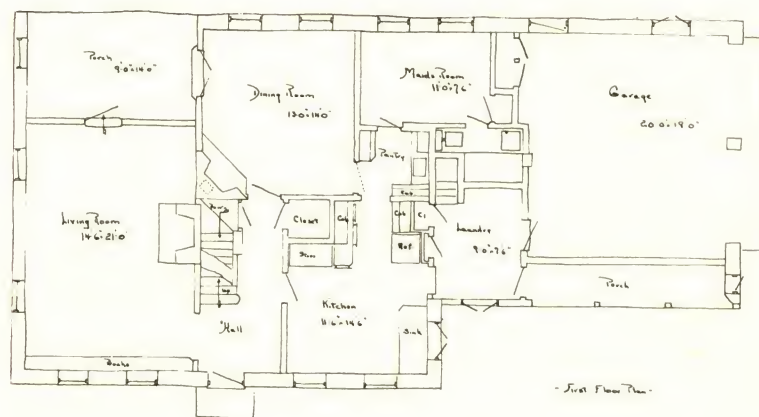
# CHAPTER 36.

A great deal is said about the various classes of houses and many people class them by price. There is the 0 to \$5000.00 class and up to the \$40,000.00 to \$60,000.00 class.

Maybe they are right with frame but not with stone. Stone has poise and dignity and asks odds of no man. Build a cheap frame house next to a mansion and you ruin both, but build it of stone and they both stand as individuals each set to stay and somehow reflecting the poise and dignity their solidity gives them so that the comparison is never made.

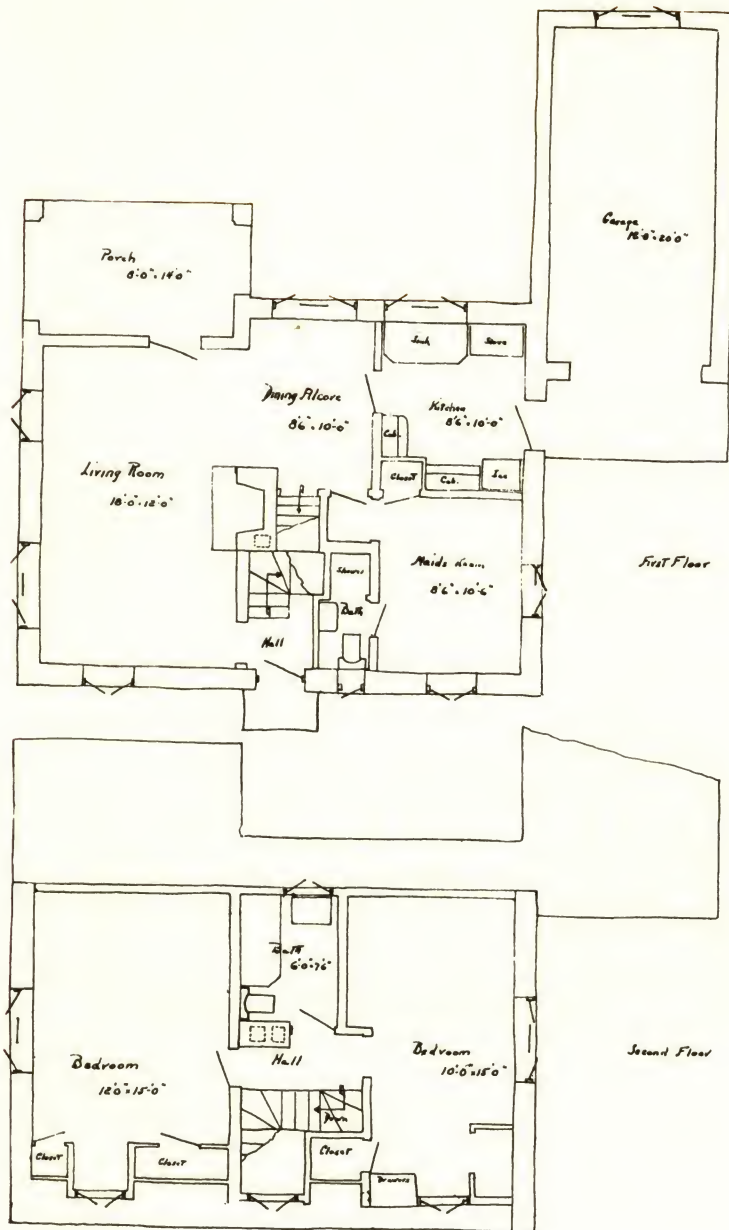
I have tried this over and over again and offer it as my final proof of the value of Field Stone as a building material.

- Plan 302 -



Designed by  
Frederick J. Schmitt  
Westport, Conn.

- Plan 300 -



Designed by  
*Frederic Thomas Bates*  
 Hartford, Conn.



### PLAN 300

Houses, like children, often are not very handsome at the moment of birth. It takes years of growth and expansion to give them bumps and lines that spell character and charm. So, in the first edition of this book, at the last moment I withheld publishing the plan and rendering of Plan 300 mentioned on page 94.

Below, however, is a rendering of Plan 302, which is a grown up version of 300, and the floor plan of 300 appears on page 164, opposite the floor plan of 302.

Build Plan 300 if you will, its lines are good, but expect it to be demanding continually the right to expand and mature into something larger and more gracious -- one version of which is Plan 302.



## A P P E N D I X

### INSULATION

The public today is insulation conscious.

Born and raised in American frame houses, they have suddenly tired of choosing between endowing the local coal baron or living in cold solitude.

To the engineer, insulation means any material which stops the transfer of heat from one body to another. He speaks in terms of coefficients, sines, and cotangents. Mineral wool or wood fibre by his code is an excellent insulator. A stone wall, on the other hand, is hardly any better than a one-inch pine board. To prove his points he holds a blow torch on one side of his material, a cake of ice on the other and both survive.

Coefficients and accurate engineering definitions, however, are beyond the ken of the layman. Insulation to him is a broad term intended to include anything that keeps cold out or heat in -- whether it be mineral wool, felt weather-stripping, or cats' whiskers.

If then the layman, our client, is to be satisfied, we must study the problem of insulation from this broader viewpoint and avoid thinking of it in its narrow technical definition, and before we select an insulating material we must study not only its theoretical qualities but its practical ones as well.

There are five main causes of heat losses in our modern small houses. Arranged in order of importance, they are as follows:

1. Losses by air leakage at doors and windows.
2. Losses by air leakage through roof.
3. Losses by air leakage through side walls of building.
4. Losses by heat transfer through glass of doors and windows.
5. Losses by heat transfer through the side walls of the building.

Ambitious manufacturers are today selling millions of tons of mineral wool to gullible architects and clients to correct the fifth item -- the least important -- when good construction, careful supervision, a roll of newsprint, and a few storm windows could be made to cover items one, two, and three -- seven to twenty times more important.

Maybe I am being too severe on mineral wool, which finds its counterpart in our daily life in cotton batting. Cotton batting is a marvelous material, yet I don't wrap myself in it when I go to bed, first because it would not stay in place, and second because if I did wrap myself in it tightly enough it would soon become soiled from my bodily excretions of perspiration.



Now buildings may not live and breathe but they do sweat (not perspire). Mineral wool, therefore, if packed tightly between the studs and joists will absorb this sweat and sooner or later rot will set in and the building will be destroyed.

Pack it less tightly and it settles and shifts with time, so it is ineffectual.

But what is the problem? It is not a problem of insulation. The problem is air leakage: air leakage between the side boards and shingles of the building, air leakage between window frames and the shell. The problem just naturally falls into the lap of a paper manufacturer.

If you seek refinement, resort to quilts or heavy padded blankets, but encase the whole building with them: roof and side walls -- stop air leakage.

That done, take your mineral wool and poke it into every troublesome corner. Pack it into the eaves -- nothing better than cotton batting, you know, has ever been found to keep water out of one's ears.

So much for insulation of houses in general, but how about Houses of Stone, more particularly Flagg Stone Houses?

An experiment I love to see tried is lighting an oil burner in a Flagg house as against a frame house. Close the cellar doors and windows. I doubt if you have any particular trouble making it burn in a frame house but I know in a Flagg house that it will go out in ten minutes for lack of air. Why? Because there are no joints between frame and foundation, there are no leaks between frames and walls, because the whole is cast together.

The problem then is simplified: tighten the openings with storm sash or weather-stripping, cover the roof with an impervious material, Cabot's Quilt, Balsam Wool, or Mineral Wool Quilt, poke her ears full of Mineral Wool batting at the eaves and you have a building, not insulated perhaps as our engineers understand the term, but which will be 100% superior to anything I have yet seen in frame or stucco.

So much for the protection from cold. Equally important today, however, is the protection from heat.

Cover your roof, your sidewalls, as I have described, with paper alone and your house is apt to become unbearable in summer. Substitute for the paper, though, a quilt of wood fibre or seaweed and the effect of the sun will be greatly reduced. Remember though that your second floor rooms when the insulation has been made perfect, the air leakage stopped, become "catch-alls" for all the heat rising from the other parts of the building. The air will not be as hot maybe as the uninsulated building but it will be most effectively retained in the rooms unless an electric ventilator with registers in the ceilings is installed in the attic to convey it outdoors.

Hundreds of dollars can be spent to accomplish this by recirculation as advocated by the manufacturers of the so-called "warm air air-conditioning heating systems" but better results can be accomplished by one of these electric ventilators and a few simple ducts costing not more than seventy dollars.

#### HEATING

A Radical at heart, I hate to admit that progress has come from the profit system. We have our "Democrats" and our "Republicans" in the building business too. The "Democrats" are the hot air people; the "Republicans", the direct radiation advocates (hot water or steam heating systems).

Years ago before we were educated to spending real money on our heating systems, the hot air furnace was developed. It was most unsatisfactory. It was seriously affected by wind, and the house was in a continuous state of "Feast or Famine" so far as heat was concerned. Other difficulties with hot air were that it was too dry and that the heat could not be put exactly where it was wanted.

To correct these difficulties, people resorted to steam and hot water. Until recently the radiator manufacturers had the market practically to themselves in the better grade of buildings. Their systems were far from perfect: hot water was slow, steam was touchy and almost as bad as hot air so far as dryness was concerned, but at least they put a part of the heat where it was most needed.

About 1929 a few movies -- a few office buildings installed air-conditioning plants to encourage summer trade. These systems became the talk of the town. Practically ruined, the hot air furnace people grasped desperately at the name "air-conditioned". They added an electrical blower, a more or less effective humidifier, a beautiful jacket, an oil burner and a thermostat to their old furnaces and passed them to the public as a new type of heating system to be called the "Air-conditioned Warm Air Heating System."

Somehow those who bought or read about these plants thought that they were a step toward summer air-conditioning. With the ducts installed, they seemed to think they were somehow a step closer to summer comfort. They thought there was some mysterious point in refrigeration still undeveloped which was the only deterrent to their immediate enjoyment of year-round air-conditioning.

But that is not the case. It is possible that air-conditioning is going to be further perfected and economized. It is a fact that about fifty years from now most houses will have summer air-conditioning, but if we had all the future improvements today, summer air-conditioning still would not be possible in your home or my home as constructed today. The change we are waiting for is not a change in the equipment but a change in the house.



Today it would cost us twenty times our winter fuel bill to cool our houses for fifty-three days in the summer. The cost is excessive because the air leakage in the best building we can build today amounts to twice the total air volume of the house per hour. Perfect the apparatus and effect economies -- reduce this cost fifty per cent and it would still cost about a thousand dollars not to perspire on a July night. Instead you would develop a cold sweat at the thought of the bill.

So it cannot be denied that an air-conditioned warm air heating system is nothing but an improvement on the old hot air heating plant. To be sure, they are automatic and they do not belch gusts of arid hot air at you, but aside from that, they are the same.

Spurred on, however, by their competitors' success and by the blind way in which the public followed like the children behind the Pied Piper of Hamelin, the direct radiation manufacturers got busy. The steam people developed an adjustable air valve which gives absolutely uniform distribution, whereas before it was very spotty. The hot water people got after the business of sluggishness and developed a motor circulator. Their system is now instantaneous and about as perfect as one could wish. Then both of them advocated enclosed recessed radiation to overcome that old "bugaboo" -- radiators as ugly and bulky as upright pianos. That done, they developed a winter conditioning apparatus to be installed in concert with radiators. This, of course, evened the score -- put them both back in the same relative position to warm air heat.

Therefore in choosing between them, you have only to decide whether you like to have the laundry done inside or outside the rooms. Do you want the air in your room conveyed to the cellar, washed, heated, and returned or do you want the heating done in the room itself? For my own part, I don't like blowers and I have yet to find the warm air heating system that isn't drafty and noisy.

I revel in the animal satisfaction of having my heat thrown at me as I sit in front of an open fire. I want the same satisfaction from my heating system. That can only be done by radiators. I like to sit at windows, yet warm air heating systems give cold spots at all openings. But decide for yourself. Remember the question is not one of air conditioning or no air-conditioning but merely whether you like to have your laundry done in or outside the room.





